WHAT ARE THE RIGHT FIRE SUPPORT REQUIREMENTS FOR ARMY AIRBORNE FORCED ENTRY OPERATIONS WITH THE CHANGING CONTEMPORARY OPERATIONAL ENVIRONMENT?

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The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U.S. Army Command and General Staff College or any other governmental agency. (References to this study should include the foregoing statement.)

ABSTRACT

WHAT ARE THE RIGHT FIRE SUPPORT REQUIREMENTS FOR ARMY AIRBORNE FORCED ENTRY OPERATIONS WITH THE CHANGING CONTEMPORARY OPERATIONAL ENVIRONMENT? by Anthony John Healey, USA, 96 pages.

This thesis studies the use of fire support platforms for Army airborne operations conducted within the new operational environment. It focused on how field artillery can be a combat enabler for maneuver during forced entry operations (FEO). It is argued that the contemporary operational environment (COE) is more dangerous and less predictable than the previous operational environment of the Cold War. In this context, the National Command Authority should maintain a rapid response, forcible entry capability to set conditions for follow-on forces. Units, such as the 82d Airborne Division and Rangers, can lead the effort in FEOs. When a maneuver commander conducts an FEO he visualizes how the operation will unfold. As part of his visualization he must consider what is the right fire support requirement to help achieve success. Currently the maneuver commander is supported by AC-130 gunships to different types of airborne field artillery and mortar units. In order for him to achieve success he must decide on the right combination of versatility, firepower, and maneuver within the different capabilities of each fire support platform. This thesis analyzes the comparison of criteria for these systems. This allows the maneuver commander and staff to decide on the right fire support platform to conduct FEOs.

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ACRONYMS

AFAR	Airborne Field Artillery Regiment
ALLTV	All-Light Level Television
AMS	Air-Mech-Strike
BCT	Brigade Combat Team
CAS	Close Air Support
CIS	Confederation of Independent States
COE	Contemporary Operating Environment
CMTC	Combat Maneuver Training Center
CSA	Chief of Staff of the Army
CTC	Combat Training Center
DivArty	Division Artillery
DGDP	Directorate of Graduate Degree Programs
DRB	Division Readiness Brigade
DZ	Drop Zone
GDP	Graduate Degree Programs
GLPS	Gun Laying Positioning System
GPS	Global Positioning System
FEO	Forced Entry Operations
HEAT	High-Explosive Antitank
HMMVW	High-Mobility Multiwheeled Vehicle
HTU	Hand-Held Terminal Unit
IRC	Immediate Readiness Company
ISB	Intermediate-Staging Base

JACC/CP	Joint Airborne Communications Command Post
JRTC	Joint Readiness Training Center
LIC	Light Intensity Conflict
MOUT	Military Operations Urban Terrain
NTC	National Training Center
PFAB	Parachute Field Artillery Battalion
PI	Probability of Incapacitation
OPCON	Operational Control
OEF	Operation Enduring Freedom
OIF	Operation Iraqi Freedom
OPFOR	Opposing Forces
REDS	Risk Estimate Distances
SEAD	Suppression of Enemy Air Defense
TTP	Tactics, Techniques, and Procedures
US	United States
USAF	United States Air Force
VDV	Vozdushno-Desantyne Vojska (Russian Airborne Assault Forces)

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CHAPTER 1

INTRODUCTION

> By now I believed we were fighting at least two People's Army battalions; turns out it was three. They were very tough and very determined to wipe us out, but a major difference between Lieutenant Colonel Nguyen Huu An of the People's Army of Vietnam and Lieutenant Colonel Hal Moore of the 1st Cavalry Division was that I had major fire support and he didn't. (1992, 121)
>
> Harold G. Moore, *We Were Soldiers Once and Young*

Landing Zone X-Ray, November 1965, 450 men of Lieutenant Colonel (LTC) Harold G. Moore's infantry battalion were transported by helicopter to seek and destroy as many enemy as they could find. During the in Vietnam War, transportation by helicopter was a new concept of fighting a war against a very determined and tough insurgent enemy. The operation described above was by definition a forcible entry operation (FEO)--seizing and holding a military lodgment in the face of an opposing enemy. For those few days in the Ia Drang valley, LTC Moore and his men did indeed face a substantial opposing force. It was an intense battle that saw thousands of enemy and hundreds of LTC Moore's men killed or wounded in close combat. With courage, determination, and superb leadership of the combat infantryman and, importantly, the help of Artillery and close air support (CAS), LTC Moore's battalion prevailed. Without these two combat enablers, LTC Moore's battalion, in common with General Custer some one hundred years earlier, could have been annihilated.

Today, national military strategy is based on a forward-deployed, force projection and first-to-fight approach to any operation or crisis that threatens the interests of the national security. If necessary, the United States will project its force by any means at its

disposal. One of those means is FEOs. This is very close, up-front and personal to the soldiers and commanders involved. FEOs are some of the most difficult operations to plan and conduct and require joint synchronization at all levels of war. As has been proven in the past, fire support is a tremendous enabler for the maneuver forces on ground. One recent example is the battle of Hillah during Operation Iraqi Freedom. The 3rd Brigade Combat Team (BCT) from the 101st Airborne Air Assault had the mission to attack the town of Hillah on 9 April 2003. The 3-320th Field Artillery directly supported 3rd BCT's attack. Prior to the attack the field artillery provided preparatory fires on the objective, as the 3rd BCT advanced to the objective, artillery continued to provide fires and destroy point targets. The Division Artillery Commander stated, "The initial onslaught of accurate massed fires was credited with destroying the enemy's will to resist and a general collapse of the enemy's defense" (Greer Holland and Kean 2003, 18). This allowed the maneuver forces to rapidly advance and secure the Hillah by mid-morning with minimal collateral damage to the town and casualties to 3rd BCT. Maneuver commanders want to bring their fire support and artillery with them into battle. The BCTs train for this opportunity daily.

The US Army is currently evolving and changing at a rapid pace. The challenges the US and its armed services face are due to several evolving and new world changes. Significant amongst these are:

1. A new form of operational environment, now called the contemporary operational environment (COE)

2. An increased rate of technological change

3. A vastly immense information evolution

4. A new form of battlefield framework

In comparison with only a few decades ago, the combatant commander today has a variety of problems when engaged in conflict. The COE has forced today's commander to be responsive, versatile, and flexible when it comes to conducting operations based on the strategic objectives of the US. The national military objectives of the armed forces are "promote peace and stability and when necessary defeat our adversaries" (Chairman of the Joint Chiefs of Staff 1997, 2). Along with that, the Armed Forces primary task is "to fight and win our nations wars" (Chairman of the Joint Chiefs of Staff 2000, 1). The bottom line to these objectives is that the military must be ready to conduct full-spectrum operations in any operational environment. Since 1997, this is the guidance for the armed forces, as stated in *The National Military Strategy*. Therefore if deterrence and diplomacy fail, FEO is just one of many options available to the combatant commander. The ability to project a brigade-sized force on a piece of terrain anywhere in the world in just a matter of hours is a huge instrument of power capable of showing the United States' national power.

This thesis examines and discusses the need for fire support platforms to be used to enhance combat power for maneuver forces in FEOs. In the last sixty years airborne forces have been a huge part of US military force projection and military crisis solving. However, as the US Army adapts to COE, fire support platforms have been left as an afterthought mainly for low-intensity conflicts. This chapter will provide background information on how airborne operations developed and use within military campaigns. Additionally, this chapter will outline the question on what are the right fire support platforms used for FEOs, key terminology, and thesis structure. Finally, in this

introduction, the problem the US military is having with adapting to the COE while transforming to meet the needs of the national military strategy will be identified.

Background

In this section, the key terms of reference are defined and a history of the development and use of Airborne Artillery is provided. Fundamental to this thesis is the concept of a FEO. Joint Publication 3-18, *Doctrine for Joint for Forcible Entry Operations,* defines FEOs as "seizing and holding a lodgment in hostile or potentially hostile territory that, when seized and held, will enable continuous landing of troops and material and provide maneuver space for subsequent operations" (Joint Pub 2001, vii). A combatant commander conducts FEOs by amphibious assault, airborne assault, air assault, or a combination of methods. This thesis does not focus on all forms or ways of conducting a FEOs, but focuses specifically on airborne assaults.

Airborne artillery only has a history of some eighty years. It began in the early 1920s with Soviet airborne military doctrine. It was a time period where military intellectuals (Tukhachevskys, the Triandafilovs, the Issersons, and others) had imaginative minds and a passion for military development. These men, in the context of an industrial revolution and a conditioned philosophy from past experiences, wanted to elevate the Soviet Union military to the level obtained within the rest of Europe. These theorists were tired of the European wars of attrition and stagnant defense. They also felt an obligation to maintain an offensive dominance (Glantz 1984, 2). They produced the "*Unified Military Doctrine;*" this was a doctrine which was a dedication to the maneuver and offense in the real world of deep battle. This new doctrine addressed deep battle as a supplement to enhance the combined arms tactics against the enemy (Glantz 1984, 3).

The Russians also utilized the new emerging technology of tanks and aircraft and incorporated these weapons into the deep battle concept. Maintaining the offensive dominance ideal, aircraft was used as additional firepower. The second concept developed was vertical envelopment (a form of maneuver from air, in which an attacking force seeks to avoid the principal enemy defenses, by seizing objectives). The third concept was “battlefield dimension.” It was thus that the concept of airborne operations was born.

The Russians tested airborne operations in August 1930 by initially using troops with light weapons to secure special targets or airfields. Once secure, the Russians would allow for air-lands of mechanized main forces to include artillery to disrupt rear enemy forces. At the same, they attacked with mechanized forces along the defensive front. Russian maneuver exercises from 1934 to 1937 confirmed the validity of airborne forces in conjunction with the deep battle doctrine (Glantz 1984, 13). By 1939 the Russians had six brigades and three regiments of airborne forces. However by 1941, the shift in deep battle focused on mechanized forces and the airborne forces doctrine remained stagnant for years to come (Glantz 1984, 17).

Several countries took note of the Russian development of Airborne Doctrine and large force employment during the interwar period. The Germans developed the idea along the same lines as the Russians. The idea of the offensive theory mindset appealed to them. They began organizing airborne units in 1930. The Germans thought, “it offered great attack, which was something that was occupying the minds of the German Army planners, and it looked to be a suitable way of speeding up the armored thrust of the Blitzkrieg” (Glantz 1984, 17). In 1938, General Kurt Student formed the 1st German

Airborne Division (7th Parachute Division). It was organized with parachute infantry battalions and air-land infantry battalions. It used the strategy of parachuting on an objective and allowing for follow-on air-land forces of artillery, anti-tank guns and other support to complete the offense maneuver. On 10 May 1940, the Germans conducted the first combat airborne operations with four parachute battalions and two air-land regimental glider forces (Flanagan 2002, 6). Following a few minor successful airborne operations, Germany invaded Crete in 20 May 1941 using the 7th Parachute Division. Named Operation Mercury, the German Army employed a combined arms operation, using parachute infantry battalions and heavy drop equipment of artillery and antitank guns. However, due to the high cost of casualties (5,140 men, 350 planes), Hitler did not use large-scale airborne operations throughout the rest of World War II (Flanagan 2002, 18). Instead, Germany used small parachute units to seize rear area objectives or reinforce other units, and never again dropped artillery units. Hitler has many reasons not to ever use large-scale airborne operations. His main reason was that Hitler was appalled that the German soldiers jumped in broad daylight without the use of tactical surprise. The defenders knew they were coming and properly planned for the airborne assault by building antiaircraft positions, machine-gun nests and camouflaging units in and around the three airfields. The German troops jumped unarmed and had to scurry for weapon bundles on the ground. The Germans never dropped their parachutists in mass formation. Instead they were dropped in small units one at a time. The US watched, and learned lessons from this airborne assault. The experience of Crete taught the Americans that if the airborne assault is near sea, control must be maintained of the air and sea. More, the necessity of tactical surprise was also learned. And most importantly, it was noted that

the use of division-sized forces are effective and employable as long as the airborne operation is well resourced with adequate aircraft, supporting units, and reserves (Flanagan 2002, 17).

The then Chief of Staff of the Army General George Marshall initiated a project to study feasibility of airborne forces. Eventually this task fell to Major William C. Lee. He organized the Parachute Test Platoon in July 1940 (Flanagan 2002, 10). William Lee's mission from then was to establish the new parachute battalions and glider battalions. By August 1941, the US Army had three infantry battalions (501st, 502d, and 503rd), and two air-land infantry battalions. The Crete experience for Germany underscored the need for the US to move forward developing airborne units. At that time, the US were just experimenting with infantry battalion-sized units. Lessons learned from the Crete operation helped the further development of tactics, size, composition, and missions for the airborne forces. The plane of choice to both transport the paratroopers and drop their equipment was the C-47 transport plane. The glider was the CG-4A Waco.

It was not until the airborne battalions were established that the 456th Parachute Artillery Test Battery was conceived. Lieutenant Joseph Harris led the battery. He was charged with developing a system to airdrop artillery guns with artillerymen to provide fires in support of the infantry on the ground (Flanagan 2002, 25). At the time 105-millimeter howitzer (the M3 infantry cannon) was the primary weapon to provide artillery fires for the infantry divisions. It had a range of over twelve kilometers. But this howitzer was too heavy and too big to airdrop. The 105-millimeter howitzer was later used to air-land with the glider troops. The weapon of choice for the airborne artillery, therefore, was the 75-millimeter Pack howitzer. This gun weighed 1,260 pounds and

could be disassembled into nine pieces: “Pack” in the name of the howitzer meant that it was carried by a mule through rough terrain. The range of the 75-millimeter Pack howitzer was 9,475 yards. Artillery units air-dropped behind enemy lines. Their mission was to provide close supporting fires for maneuver units, so a range of 9,475 yards was plenty of range to achieve success with close targets. Lieutenant Harris and his men came up with a system in which the howitzer was disassembled into nine bundles that could be air dropped out of the door or attached to the bottom of the C-47. Once over the drop zone, the artillerymen would release the equipment and jump after it. After landing they would locate the bundles and assemble the weapon. It would take the artillerymen thirty minutes to assemble the howitzer and shoot it during daylight and up to one hour during night (Devlin 1979, 122). The primary means of moving the howitzer was manpower. Later this Battery would become the first Parachute Field Artillery Battalion (PFAB), the 456th, organic to the 82d Airborne Division.

August 1942 saw the activation of two of five Airborne Divisions, the 82d and 101st. Thus began the history of the airborne in the U.S. Army, along with a new way of employing artillery. By the end of the war there were a total of twelve PFABs. In 1943, the field artillery developed a way of getting the 105-millimeter howitzers to support airborne assaults. The howitzers and crews were loaded in a Waco CG-4A Glider. Glider battalions were then used in conjunction with the parachute forces or follow-on air-lands. By the end of World War II, there were nine glider field artillery battalions. A parachute field artillery battery with 4 guns and 108 men would require 9 C-47 aircraft. One Waco CG-4A glider could transport one howitzer section with equipment. Artillery now had a twofold mission with the airborne forces: (1) parachute behind enemy lines with the

infantry to provide crucial firepower for the maneuver commander or (2) glide assault in with the follow-on forces (Devlin 1979, 122).

During the remainder of World War II, theater commanders tested the usefulness of the airborne forces in several operations. Each operation yielded lessons, which were then incorporated into future airborne operations. The first time the US Army conducted a large-scale airborne operation was the invasion of Sicily in July 1943 (Operation Husky). The 456th PFAB tested its concept and techniques in combat with the 505th Parachute Infantry Regiment (PIR) from the 82d Airborne Division. Operation Husky called for the 505th PIR and two batteries from the 456th PFAB to jump in behind the 1st Infantry Division's beachhead to block German counterattacks of the amphibious assault in the vicinity of Gela (Blair 1985, 77). Bad weather, navigational problems on the troop air carriers, complications of night, and unit assembly difficulties prevented the airborne artillery from being fully utilized. In its first operation the airborne artillery concept did not meet the expectations it initially promised at Fort Benning. Only one out of twelve 75-millimeter pack howitzers was able to provide effective fires during a fight at Biazza Ridge. The rest of the battalion was too far scattered and separated from their equipment to contribute to the fight.

D-Day, 6 June 1944, was the next scheduled parachute drop for the airborne forces. This operation called for two airborne divisions (82d and 101st). The plan was for the 82d and 101st Airborne Divisions to seize key objectives behind enemy lines to allow three divisions to conduct an amphibious assault landing on the Normandy beaches. Airborne field artillery was seen as potentially promising for this operation. The 456th PFAB would drop one battery, and the 377th PFAB would drop the whole battalion

(twelve guns). However, once again, due to adverse conditions and lost and damaged equipment only one gun was able to provide fires for the infantry. It would be two weeks before indirect fires were effective for the Airborne Divisions in Normandy.

Operation Market-Garden was the only truly effective combat parachute for airborne artillery. On September 1944, the 376th PFAB loaded forty-eight C-47s and jumped into Holland to provide fires for the 82d Airborne Division. Due to good weather, a daylight drop, and limited antiaircraft, the 376th PFAB had one gun up and ready to fire with in twenty-two minutes of landing and one complete battery ready within one hour. The battalion was able to provide suppressive fires, disrupt German movement, and secure drop zones for follow-on forces. This made Operation Market-Garden a success for the airborne artillery (Glass 2000, 21).

Over the next fifty years airborne technology changed. Notwithstanding these changes, the tactics for artillery heavy drops and providing fires are still very similar to those used during World War II. Operation Just Cause in Panama showed that airborne assaults were still viable. Supporting a BCT from the 82d Airborne Division, a battery with four guns parachuted into Torrijos-Tocumen Airport. Only one gun was damaged during the drop, and the battery was able to provide only limited firepower for the maneuver because of the rules of engagement criteria. All these operations were successful overall in their own rights, and showed a need or a capability that must be available to rapidly project a force over great distances in times of national crisis.

Problem

Since the end of the Cold War, the Operational Environment the US exists within has changed and is more undefined. Along with that, adversaries the US are facing have

changed and are more ambiguous. The world is moving into a more highly technological, digital, and information based society. Threats are more fluid, transparent, and asymmetrical. These changes have forced a new national security strategy and in turn military strategies that eventually drive the effects of conducting military operations. The new military visions and strategies are shaping how the armed forces will fight in this new complex environment.

The COE is a complex environment that has a new operational framework. No longer is the US seeing the cookie cutter Cold War area of operations. The area of operations has changed along with the battle space. The operational framework the Army operates in today can be linear or nonlinear, continuous or noncontiguous. Such indeterminacy changes doctrine by forcing the military to adapt new tactics, techniques, and procedures (TTPs). The US is fighting a global war on terrorism. The president of the United States wants to "rid the world of evil" (The White House 2002, 5) while conducting foreign and humanitarian assistance. The US must be ready to deploy BCTs anywhere in the world within ninety-six hours and conduct decisive war-fighting or support and stability operations. Artillery is commonly known as the "King of Battle" during combat operations. Over the last fifty years, airborne artillery continues to be a part of that, and has developed a relationship with maneuver to provide fires in support of close combat operations.

Due to the rapidly changing operational environments, new operational frameworks, and transformation of the Army due to modernization, FEOs might be considered a thing of the past with the changing future force. Today's change in operational environment has forced the US government to re-think how hot spots around

the world are strategically examined. If the military is required to go into a country, it is usually launched from an intermediate staging base (ISB). Two recent examples, Afghanistan and Iraq showed that the US Army can conduct military operations without a high-risk FEO. Today's technology emphasizes precision fires at a greater distance to reduce the need for on the ground fire support close to troops. As the range of new assets increase along with the precision of their effects, some new assets will play a new role in the delivery of operational and tactical fires especially for increasingly riskier operations. However, Afghanistan taught some hard lessons when BCTs left their artillery capabilities at home. One such lesson was Operation Anaconda. Enemy forces pinned down a unit from the 10th Mountain Division without artillery support. This unit ended up relying on air support, which was not as responsive to artillery. During the last couple of FEOs, artillery has been nonexistent unlike World War II and the Korean War. The 173rd Airborne Brigade seized an airfield in Operation Iraqi Freedom without airborne artillery. This thesis addresses the relevance and viability of airborne artillery as a combat enabler during FEOs.

Research Question

The key research question addressed in this thesis is: What are the right fire support requirements for Army airborne FEOs with the contemporary operational environment? This question will be broken into the following:

1. Is tube artillery needed in the initial phase of an airborne FEO?
2. If it is a capability that can be used, do TTPs need to be improved?
3. How can Airborne Artillery be an enabler in the COE?

4. How has the new operational framework (nonlinear and noncontiguous battle space) affected airborne artillery doctrine from the past AirLand Battle doctrine?

5. How are other countries experimenting with airborne artillery operations, such as the British or Russians?

Significance of Study

The topic of this thesis is airborne artillery tactics and operations in relation to FEOs. Airborne artillery has been around since the inception of airborne operations during World War II. Over the years TTPs have changed dramatically in how artillery conducts these types of operations. Some past examples of how artillery employed to combat were parachute, glider, and air assault. Today we still maintain a large airborne community that trains on these techniques. General Maples, the Field Artillery Commandant, says,

> In today's rapidly changing contemporary operational environment (COE), there is an unprecedented need to achieve true synergy between fires and maneuver. . . .The Army clearly has articulated the need for a cannon as an integral component of this fires system to provide immediately responsive, continuously available fires to maneuver units for the unforeseeable future. They give us the ability to deliver close supporting fires, often in close proximity to friendly forces 24 hours a day in all terrain and under all weather conditions. (2002, 3)

The artillery community is undergoing a large rapid all encompassing transformation, to include mission, equipment, and personnel to try and meet the future challenges of the changing Army. One of these is fire support conducted in FEOs. If the Army continues to maintain a forced entry option, the right amount of firepower, dependent on the situation, must be employed for it to be successful. The scope of this thesis will be at the division level of operations and below. Additionally, this thesis will

focus on how artillery and fire support can enhance the Brigade Combat Team or Battalion Task Force that conducts airborne operations.

Key Terms

a. Air-head Line: A graphical control measure that defines the limit of the objective area (82d Airborne Division 1998a, 5).

b. Air Mech Strike (AMS): An offensively oriented, flexible, multidimensional maneuver force. It is the projection of protected, mechanized forces by air-land, paradrop (Airborne), and helicopter (Air Assault) insertion from both internal and external loads (Grange, et al. 2002, 18).

c. Contemporary Operational Environment (COE): The operational environment that exists today and for the clearly foreseeable future. It is contemporary in the sense that it does not represent conditions that existed only in the past or that might exist only in the distant, hardly seeable future, but rather those conditions that exist today and in the clearly foreseeable near future (United States Army, Command and General Staff College 2003, i).

d. Coup de Main: An offensive operation that capitalizes on surprise and simultaneous execution of supporting operations to achieve success in one swift strike (Joint Pub 3-18 2001, GL-6).

e. Direct Support Fires: A field artillery tactical mission used to provide responsive field artillery fires to a particular maneuver unit (FM 3-09.21 2001, 1-4).

f. Forced Entry Operations (FEO): Forcible entry operations is seizing and holding a lodgment in hostile or potentially hostile territory that, when seized and held,

will enable continuous landing of troops and material and provide maneuver space for subsequent operations (Joint Pub 3-18 2001, I-1).

g. General Support Fires: A field artillery tactical mission that provides field artillery fires for a maneuver unit as a whole and remains under the control of the force artillery headquarters (FM 3-09.21 2001, 1-5).

h. Lodgment Area: A designated area in a hostile or potentially hostile territory that, when seized and held, makes the continuous landing of troops and materiel possible and provides maneuver space for subsequent operations (82d Airborne Division 1998a, 5).

i. Operational Framework: The arrangement of friendly forces and resources in time, space and purpose with respect to each other and the enemy situation. It consists of area of operations, battle space, and the battlefield organization (FM 3-0 2001, 4-18).

j. Risk Estimate Distances (REDs): REDs are defined as the distance in meters from the intended center of impact at which a specific degree of risk and vulnerability will not be exceeded (FM 3-09.4 2002, A4).

k. Team Fires: An 82nd Airborne TTP that task organizes the battalion 81-millimeter mortars OPCON to the Direct Support Artillery Battalion during an airborne assault in order to provide fires under central control by the brigade commander (82d Airborne Division 1998a, 5).

Thesis Structure

To answer the thesis questions, the research addresses other fire support requirements for forced entry operations. It will address capabilities and limitations of other fire support and artillery options, based on the changing environment and missions

types. Chapter 1 provides the background information, addresses the research question, significance of the study, and key terms and definitions.

Chapter 2 contains the literature review. It summarizes the existing literature and identifies gaps in current literature. Areas that I investigated are FEOs, airborne operations, forces conducting FEOs past and present, COE, airborne artillery, and different fire support platforms.

Chapter 3 represents a brief outline of the methodology used in this thesis. This thesis takes an historical perspective to help identify the needs for fire support for FEOs during initial and follow-on phases in relation to the COE.

Chapter 4 forms the analysis of the thesis based on the criteria presented in chapter 3. The analysis will identify the different types of fire support requirements needed for Army airborne operations. This chapter also offers a comparison of other countries conduct of airborne operations and the fire support they employ.

Chapter 5 draws the dissertation to a close by summarizing the discoveries that emerge from the evidence and analysis and provides a conclusion for the research question. It makes recommendations needed in order to improve TTPs and what assets can be used for fire support during FEOs.

CHAPTER 2

LITERATURE REVIEW

This chapter reviews the literature relating to fire support used in airborne operations. It is divided into five sections, which examine, in turn the national military strategy, FEOs, historical perspectives, COE, and fire support platforms. What reviewing the literature reveals is that over the last ten to fifteen years much was written about FEOs. There are plenty of readings on the nation's military strategy, FEOs historical perspectives from previous army airborne operations, CEOs, and capabilities of fire support platforms. What remains a relatively unaddressed area is analytical or historical information about fire support with the exception of literature focused on airborne field artillery involved as a combat multiplier for the success or failures of the past FEOs.

In general, to characterize the literature, several theses and reports have looked at the feasibility of airborne forced entry operations involving the survivability and cost benefit of conducting this type of operation. Much of the literature written in the last ten to fifteen years agrees that mobility, lethality, and airlift are key points in order to make a FEO successful, which the literature also argues are still needed. The conclusions noted that FEOs are still needed. But questions remain. How can the military enhance FEOs with mobility and lethality to make them successful given the new COE? How can the airlift capability be improved? Will the new COE end the need for conventional Army airborne operations? With new and improved technology and tactics the common theme for FEO was mobility and lethality.

This chapter analyzed whether the gap between past army airborne operations and fire support used and what type of fire support can make FEOs successful today given the COE.

National Military Strategy

Since the Cold War ended in the late 1980s, much has been written about the security, interests and needs of the US. In turn the military has changed its strategy and force structure to meet these needs. Three things drive the way in which nation's security and military strategy needs to continually change. Firstly the information age continues to develop in quantum leaps. This has influenced the shape of the US military in moving forward to the future force. Secondly, with the reduction of the Soviet Union as a world power to small nation states and the advanced growth of the US in world dominance, a new type of operational environment has emerged to which the military must adapt for success. Long gone are the linear battlefields of the 1970s and 1980s. Thirdly, the continual transformation of military forces drives the need for changing doctrine and force structure to meet the needs of full-spectrum operations dominance.

The National Security Strategy of the United States of America in September 2002 and *Joint Vision 2020* in June 2000 outline in detail how and why the military armed forces exist today. It focuses on the purpose of the military so a course of action for transformation can be developed to meet the interests of the president and the US focus in the world. These documents, plus the newly published FM 3-0, *Army Operations,* highlight the need for full-spectrum operations (offense, defense, support, and stability operations). Both show that in order to win decisively through full-spectrum operations the US must use joint capabilities to its maximum capacity. Both documents highlight

that the US is a world power, with interests that reach all over the world. If these interests are jeopardized then the US must have the capability to project force rapidly. This means rapidly deploying forces through a type of forced entry or unopposed entry, to protect US interests.

Forced Entry Operations

There are several documents, articles, and manuals on the conduct of forced entry operations. The baseline for Army doctrine, FM 3-0, *Army Operations* (June 2001), states that the US must maintain the ability to conduct FEOs both unopposed and opposed. FM 3-0 supports joint firepower used in conjunction with maneuver forces to achieve a rapid force buildup, as well as maximize the mobility and lethality of artillery to achieve FEO success. Once the initial lodgment is secure, the force must rapidly transform to a defensive force in order to allow follow-on forces for the rapid force buildup. A second manual FM 90-26, *Airborne Operations* (December 1990), offers the baseline doctrine on how to conduct airborne FEOs. A key phase in conducting an airborne assault is the initial assault. The purpose of this phase is to establish a military lodgment in order to seize and hold an airfield or airhead to allow continuous landing of troops and equipment to conduct follow-on operations. The initial assault is the most vulnerable part of the FEO due to units assembling on the drop zone, seizing initial objectives, and assessing the situation. Chapter eight of FM 90-26, *Airborne Operations,* lays out the necessities of fire support in conducting FEOs. Like any other combat operation, fire support provided for maneuver forces throughout the operation must be planned. During the initial assault, a unit can be placed in direct contact with the enemy or even deep in hostile territory. The criticality of needed fire support while assembly from other than organic assets is

essential for its success. Assault forces must have immediately available joint fire support to destroy, interdict, or suppress enemy forces. Once units are assembled, many types of organic fire support (such as mortars, artillery and tactical air support) can help provide continued support for the initial phase of the FEO as a combat multiplier. Joint publications on fire support, CAS, and FEOs offer many techniques for providing fire support during this type of operation to make it successful in the initial assault phase. Doctrinal manuals outline the need for not only nonorganic fire support but also the importance of organic fire support to ensure success.

Several theses analyze FEOs. One work was a monograph by Major Gordon C. Bonham titled “Airfield Seizure: The Modern Key to the Country.” It contained several instances of past airborne operations and examined how they succeeded or failed, along with information on the tactics and the use of the elements of combat power to describe them. For example, Major Bonham analyzes each operation with the elements of combat power. His example of Operation Just Cause showed that the synchronization of firepower with maneuver was a combat multiplier. Similarly, Operation Mercury (Germans invasion of Crete in 1941) showed the assault forces lacked the organic firepower necessary to destroy the enemy defenses. Although the Germans eventually took the objective, there was an appalling high cost of life and equipment. Major Bonham’s monograph provides a measurement with criteria to show the validity of FEOs. Major Rowayne A. Schatz’s thesis titled “Airborne Forcible Entry Operations: USAF Airlift Requirements” provides an assessment of the airlift requirements to conduct FEOs and strategic lift. These include: distance of flight, potential airborne targets, size of the force, threats associated with the operation and the training needs of

crews. Major Schatz's work shows the feasibility of conducting airborne operations with the current aircraft inventory and intelligence assets. Major David Aitken's thesis "The Fallacy of Single Source Fire Support" analyzes the firepower--as in organic artillery and mortar assets developed and used in the last 100 years. Aitken compares airpower (defined as air delivered fires) with artillery and mortars and examines the effectiveness and capabilities of these assets used in the COE. He concludes that both airpower and firepower have advantages and disadvantages for each system. Aitken argues both the Air Force and artillery branch need to reshape doctrine and relook ammunitions and weapons to support the maneuver commander in all types of operations.

Historical Perspectives

There are many works that have summarized airborne operations. Most deal with maneuver and very limited studies of combat support systems (for instance, airborne artillery and other fire support assets, i.e., CAS, artillery, and mortars). Books, such as *Airborne* by E. M. Flanagan and *Paratrooper* by Gerard Devlin, offer insightful historical perspectives of the US airborne from its inception in the 1940s to present. Both books address airborne operations from the requirements needed as in troop carriers and types of operations conducted. One article from the *Field Artillery Journal* titled "Cannons Under Canopy" by Major Scott T. Glass addresses the usefulness and success of dropping airborne and glider artillery in Operation Market-Garden. It provided examples of how artillery was a capable combat multiplier and helped the success of the 82d and 101st Airborne Divisions in that operation. It further showed the necessity of airborne artillery in large-scale FEOs. *The Soviet Airborne Experience* by LTC David M. Glantz provides a unique view of the inception of airborne forces and equipment from the Soviet

standpoint. Glantz shows how the Russians developed their concept of airborne operations, doctrine, and organization to perform a multitude of missions with airborne forces from 1935 until the present.

Contemporary Operational Environment

The Army is currently at war and it looks like it will continue to have high multiple and simultaneous deployments against several adversaries in the near future. The field artillery is at a point of significant change due to continuous transformation and the global war on terrorism. Several articles, book, and manuals discuss the changing COE. *The National Security Strategy of the United States of America* (September 2002), and *Joint Vision 2020* (June 2000) are two key works that address this issue. These publications define how the operational environment has changed. This thesis refers to these changes as the COE. The US trains its forces to adapt to these changes, the manual ST 7-100, *The OPFOR Battle Book for the Contemporary Operational Environment* (June 2003), addresses the new OPFOR. Recently rewritten, it replaces a manual that was based on an OPFOR paradigm that no longer exists. No longer is this manual aligned with the old Soviet Union and its allies along the linear, contiguous battlefield. It defines eleven variables in how the new OPFOR fights and shows how it shapes the COE. It states that the new OPFOR will be less predictable and hard to template (identify) as the situation changes. The OPFOR will learn from its training and combat lessons with itself and adapt to new situations. The new OPFOR variables and lessons they learn allows the OPFOR commander sufficient freedom of maneuver, creativity, and initiative in any situation. ST 7-100 provides a guideline of basic OPFOR doctrine on how they fight. This manual allows forces to address planning and conducting operations as they train for

combat in the COE. This new manual also focuses the CTCs to use OPFOR that are trained to replicate an operational environment that the military faces today.

Other theses and articles provide an understanding of the COE with maneuver and fire support to understand how the joint firepower and fire support community must adapt to be successful. One thesis by Major Thomas Young, "Force XXI: King of Battle or Twenty-First Dinosaur," examines the current artillery force structure, how will it be seen in the information age, and the support of full-spectrum operations. He determined that the future field artillery is adequately preparing itself for the challenges of the twenty-first century, based on future organizations, operational concepts, and technology. He concludes that future artillery effectively support military operations across the full-spectrum of conflict by being more flexible, survivable, and able to deliver decisive fires than with the past AirLand Battle doctrine. *Field Artillery Journal* article by General Micheal D. Maples, "The FA and the Objective Force: An Uncertain but Critical Future and Fires TTP for the COE," argues that the field artillery community must achieve a true synergy between fires and maneuver to be successful in providing fires for the future maneuver commander. Using effects of fires with a mix of indirect capabilities and the continuing need for cannons will permit effective maneuver of forces to achieve decisive outcomes. General Maples concludes that the US is at war and at the same time transforming. In order to win, it requires fires of its field artillery to accomplish national objectives while aggressively attempting to resolve issues the field artillery face to transform.

Fire Support Platforms

The different types of fire support platforms available for the maneuver command and used for this study are the Air Force AC-130 (SPECTRE) gun-ship, tailored howitzer packages for heavy drops, the Team Fires concept of the 82d Airborne Division option one and two, infantry battalion mortar systems for heavy drop, and howitzer sections air-landed as follow forces.

To successfully plan an airborne operation the commander and staff must resource the assets. This section examines which are best for the initial phase of an airborne operation by comparing various options mentioned above. There are many manuals, books, and articles that can show the capabilities and limitations of each option, and how to employ these systems. All levels of field artillery field manuals, such as FM 3-09.30 and FM 3-09.40, have capability tables of fire support systems which include naval gunfire systems and CAS. They address ranges, rates of fire, ammunition options, and risk estimate distances (REDs). One *Field Artillery Journal* article by LTC Christopher Bentley, "Afghanistan: Joint and Coalition Fire Support in Operation Anaconda," provides new emerging techniques and procedures the fire support community to employ from lessons learned in the COE. For instance LTC Bentley addresses several important fire support lessons, such as targeting, fire support coordinating measures (FSCMs), fires execution and fire support team (FIST) resourcing and training. These lessons learned will help the fire support community develop TTPs for the future force. LTC Bentley reveals that while airpower and attack helicopters are important and can provide decisive fires, it is restrictive (altitude, weather, and not as responsive). At the same time indirect fires provided the ground forces responsive,

massed fire with multiple shell fuze combinations anytime, anywhere. These example shows how indirect fires provide increased versatility compared to airpower.

To summarize there is a growing body of literature that can be used to understand what is the right fire support platforms to use in FEOs in a new COE. However, most literature is limited in its usefulness. There are many books, manuals, and articles that discuss FEOs, but there is only a partial study into airborne artillery. Therefore, in order to draw conclusions from the literature that supports the thesis an analytical framework must be developed. For this, this thesis will address five particular criteria: firepower, versatility, maneuver, limitations, and capabilities. Examining the various fire support platform in relation to these criteria will aid the task of determining which fire support platform is suitable for FEO.

CHAPTER 3

RESEARCH METHODOLOGY

This chapter discusses the type of methodology used and how it relates to the research question. Based on the research conducted and literature reviewed, it was determined that five criteria will be used in evaluating the validity of what is the right fire support platform to use in FEOs. The types of fire support platforms used for this study are the Air Force AC-130 (SPECTRE) gun-ship, tailored howitzer packages for heavy drops, the Team Fires concept of the 82d Airborne Division (two options), infantry battalion mortar systems for heavy drop, and howitzer sections air-landed as follow-on forces. This chapter then discusses the reasons for the using the evaluation criteria of limitations, capabilities, firepower, versatility and maneuver in comparing and contrasting fire support systems. Finally it outlines assumptions and what the next chapter addresses.

This thesis uses a historical methodology. It analyzed written records of past occurrences in order to draw conclusions for the different types of fire support platforms that can be used for FEOs. Specifically, the thesis compares the firepower, versatility, and maneuver of each fire support platform. Having described the capabilities and limitations, it is necessary to determine how each of the systems fits into an element of combat power, a tenet of the Army, and a principle of war.

Describing the capabilities and limitations is an important task because it helps delineate how each fire support platform performs by determining the advantages and disadvantages best suited for FEOs. After this is done, the thesis then compares these fire

support platforms with some doctrinal foundations (firepower, versatility, and maneuver) in order to establish a set of criteria to evaluate and determine the validity of use. There are five elements of combat power. Commanders combine these elements (firepower, maneuver, leadership, information, and protection) to meet the constantly changing COE and defeat the enemy. Firepower complements maneuver and when synchronized together can achieve a decisive victory with a destructive force that defeats the enemy's will to fight. Firepower can be achieved at the operational and tactical level of war. This specifically relates to different fire support platforms combined with maneuver elements (FM 3-0 2001, 4-6). The other criteria for evaluating fire support platforms are the principles of war (maneuver). The nine elements of the principles of war are the bedrock of Army doctrine and set out the necessary conditions for the success of army operations. Maneuver is defined as placing the enemy in a disadvantageous position through the flexible application of combat power. Commanders use maneuver to keep the enemy off balance and combine it with the other principles of war and elements of combat power to achieve decisive victory (FM 3-0 2001, 4-14). Lastly, this thesis used the tenet of Army operations--versatility as a criterion for evaluating the validity of using fire support platforms in FEOs. The tenets of Army operations build on the principles of war, they describe success of Army operations and if not used can result in failure of an operation. Versatility is defined as the ability of army forces to meet the global, diverse mission requirements of full-spectrum operations. Without versatility any operation can be jeopardized. In relation to fire support assets this means providing different types of supporting fires based on the changing operational picture of a FEO (FM 3-0 2001, 4-18).

The nature of airborne FEOs implies the potential for, inter alia, immediate contact with adversaries, landing intact with weapons, ammunition and other combat equipment, a time lag between landing and emplacement of weapon systems, and the potential for a lack of adequate ammunition for a protracted engagement. When properly employed, airborne forces can aggressively seize and maintain the initiative until follow-on forces are committed to the fight (Joint Pub 3-18 2001, B-1).

In order to conduct the examination of these capabilities, limitations, and doctrinal criteria this thesis has to rely on some given assumptions. One is that the Army will continue to use airborne operations in the future in relation to the COE and the guidance of the national security strategy. The second assumption is that strategic airlift using C-17s and C-130 Air Force aircraft will not hinder the ability to conduct battalion plus-sized FEOs due to the number of aircraft they currently have available. The third assumption is that forces that conduct army airborne operations are the Rangers, the 82d Airborne Division, or the 173rd Airborne Brigade. These units are the primary resources in the army to conduct such operations and have done so in the not so recent past in Operations Just Cause and Iraqi Freedom.

In the next chapter, the thesis addresses a foundation of the COE with Army airborne operations, risk assumed by the threat present for airborne operations, planning considerations for airborne operations, and purpose of airfield seizures. Following on from this, the thesis compares some historical examples of FEOs during World War II and Operation Just Cause to show the viability of fire support and its need and importance to be a combat multiplier to enable maneuver units on the ground. It also compares other outside sources of FEOs by identifying other countries (such as Russia)

strengths and weaknesses of fire support assets used in airborne operations to determine if there is a better way of supporting maneuver in FEOs. Once conclusions have been analyzed and addressed, the data can be used to answer the primary and secondary research questions.

CHAPTER 4

ANALYSIS

This chapter forms the analysis for the thesis. It looks at how FEOs are conducted by the 82d Airborne Division along with the airborne artillery's role. Also, it looks at the relationship of the COE and planning factors in regards to FEO. A comparison of the fire support platforms using the criteria discussed in chapter 3 will form the basis of what fire support platform is right for FEO. Finally, a comparison between the Russian airborne forces and 82d Airborne Division will show two different approaches to FEOs today. It is crucial to understand the capabilities and applications of FEOs. Joint Publication 3-18 defines FEO as seizing and holding a lodgment in hostile or potentially hostile territory that, when seized and held, will enable continuous landing of troops and material and provide maneuver space for subsequent operations. Entering a country can occur by three primary ways: the airfield or airports, port facilities, or beachheads. The three capabilities of FEOs are airborne assaults, amphibious assaults, and air assaults. The United States Marine Corps specializes in amphibious assaults. The 101st Airborne Division (Air Assault) specializes in air assaults. The Rangers and 82d Airborne Division specialize in both air assault and airborne assault FEOs. Army airborne operations seizing airfields or airports are only discussed in this thesis. The objective of FEOs is to seize an airfield against a limited threat, secure the airfield, and have it operational for air-lands within four hours. Operational applications of FEOs are the initial phase to start a major campaign (such as Operation Overlord in Normandy France), a major operation within a campaign (for example, Operation Market-Garden), or a coup de main (for instance,

Operation Just Cause). Army airborne operations, specifically the 82d Airborne Division, were involved in all three operational applications of FEOs. The concept of airborne operations is to land intact with all weapons, ammunition, and other combat equipment and to be prepared for combat operations immediately. Airborne operations can be conducted by parachute assault, air-land, or a combination of both. Planning an army airborne operation involves using joint forces. Units involved are specially trained combat forces. So, for example, in any one operation the army paratroopers, their equipment and logistical trail, the airlift provided by the Air Force, the combat control teams to set up drop zones, and a variety of fire support provided by all services take part (JP 3-18 2001, A 4).

Airborne operations can be tailored in a variety of different forms depending on how the commander visualizes his intent for success. The airfield seizure is the primary mission for the airborne operation. A strategic or operational FEO--especially the seizure of a major airfield--allows the commander a means by which to create a lodgment to enable follow-on forces and rapidly build up combat power. After the commander decides on what type of airborne mission will take place, planning fire support can take on a variety of different missions based on his intent to achieve success. Until the lodgment is secure and follow-on forces actually arrive, fire support is limited to CAS, mortars and field artillery. These assets can provide suppression of enemy air defense (SEAD), reconnaissance, air interdiction (AI), preparatory fires for the objective, counterbattery fires, and direct support of maneuver. During the initial phase of the airborne assault, fire support is limited until organic assets are assembled and operational (FM 90-26 1990, 8-2). In the meantime, and while the tactical unit is enroute to the drop

zone and the unit is assembling on the ground, fire support is coordinated by the Joint Airborne Communications Center Command Post (JACC/CP). JACC/CP is the airborne command post that commands and controls the airborne operation. It usually consists of an aircraft platform, such as a Hercules C-130, with a heavy communications package run by a higher headquarters command team and by intelligence and fire support cells. The secure tactical satellite networks links the airborne force commander, the JACC/CP, the elements on the ground, and rear area command post and allow for last minute adjustments, pre-assault fires, and updated intelligence (82d Airborne Division 1998a, 28). Once the unit has rapidly assembled and establishes firing capability, the commander can rely on organic fire support assets to provide close supporting fires.

In order for a FEO operation to be successful it must capitalize on speed, surprise, and mass. Surprise, a principle of war, is defined as striking an enemy at a time or place or in a manner for which he is unprepared. Mass, another principle of war, is defined as concentrating the effects of combat power at the decisive place and time (FM 3-0 2001, 4-14). Surprise can be achieved by the speed in which a large force with equipment can be dropped over an objective airfield. Thus, for example, during Operation Just Cause, 731 Rangers parachuted onto their objectives at the Torrijos-Toccumen airports in one pass involving seven C-141 and four C-130 aircraft. Later twenty-eight C-141s dropped the 82d Airborne Division's heavy equipment and over 2,100 paratroopers--all within 3 1/2 hours (Donnelly, Roth, and Baker 1991, 195). The airborne assault provided the means to mass a large force of paratroopers and equipment on the objective in a relatively short time. This allowed the forces to successfully overwhelm the enemy and rapidly secure the airfield.

There are four phases in an airborne operation. Phase one is alert, marshal, and deploy. Phase two is airborne assault and airfield seizure. Phase three is expansion of the airhead and receiving of air-land forces. Phase four is follow-on combat operations. The 82d Airborne Division trains to a standard of assembling troops and equipment and initiating the assault on the objective within thirty minutes, once the last jumper exits the aircraft. The direct support field artillery trains to a standard of assembling and putting one howitzer into operation within twenty-five minutes in order to support the assault. After the objective is secure, the field artillery consolidates and reorganizes then adheres to TTPs applicable to any other combat operations.

When planning the airfield seizure assumptions have to be considered to develop the plan for the FEO. These assumptions allow the 82d Airborne Division to narrow the unknown situation around the objective and help reduce the risk involved in the airborne assault. A list of standard assumptions to consider for the airfield seizure helps save time and assist the development of the plan. If the assumptions cannot be validated, risk of failure for the airborne assault increases. See table 1.

The comparison of today with the conditions during World War II provides illustration of how and why considering assumptions help reduce the risks of airborne operations. During World War II the forces involved in airborne operations were division to division minus in size. Hundreds of aircraft were used and flew in huge formations susceptible to enemy anti-aircraft. Losing one aircraft could result in losing a section or platoon of men or equipment. Today, over one hundred paratroopers would be lost if a C-17 or C-141 was destroyed. A loss of that magnitude can have implications on the success of the ground operation.

Table 1. Airfield Seizure Assumptions
Enemy:
1. Limited Armor Threat
2. Reaction forces vicinity the Airfield do not exceed a company
3. Enemy motorized/mechanized forces incapable of reinforcing the airhead prior to P+1.00
4. Limited Air Threat
5. Limited NBC Threat
Friendly:
1. Forced Entry Operation required
2. Airlift fleet available in sufficient numbers
3. Division of Joint Task Force will set the conditions for the airborne assault
4. Conducted by a Brigade Task Force (-)
5. Single DZ utilized
6. Air superiority exists
7. Close Air Support is available
8. Airfield supports follow-on forces
9. Runway damage is minimal and is able to be repaired within four hours or less
10. Air-land operations will commence at P+4 hours

Source: 82d Airborne Division, *Airfield Seizure* (Fort Bragg, North Carolina: 82d Airborne Division, July 1998), 7.

The 82d Airborne Division considers many planning factors when developing the plan for the airfield seizure, mostly based on mission, enemy, troops, terrain, time and civilian considerations (METT-TC). Assumptions listed in the table 1 help focus the planning factors. One planning factor considered is how to achieve adequate and appropriate fire support. As the commander visualizes how he sees the intent of the mission, he considers the necessary troops available. To seize an airfield in an airborne assault, the commander considers the options for fire support. They are Air Force AC-130 (SPECTRE) gun-ship, tailored howitzer packages for heavy drops, the Team Fires concept of the 82d Airborne Division, infantry battalion mortar systems for heavy drop, and howitzer sections air-landed as follow-on forces. The commander and staff can examine which fire support platform is best for the mission by comparing the fire support platforms available. Each fire support platform has its own unique capabilities and

limitations that differentiate one from the other. Thus, for instance, a commander might compare risk estimate distances (REDS), ammunition packages or ranges of each platform.

Once the planning for an airborne assault is complete, the commander must consider other factors while en route to the airfield objective. Many conditions must be met in order for the airborne assault to have a chance of success. These conditions are listed in table 2:

Table 2. Conditions for Airborne Assault
Minimum essential force available to accomplish the mission
Winds on the drop zone less than thirteen knots for personnel and nineteen knots for heavy equipment
Enemy ADA and FA which can range the drop zone or airhead are destroyed
Heavy machine guns vicinity the objective are destroyed
Enemy on the objective is a company minus
Enemy motorized/mechanized forces incapable of reinforcing the airhead prior to P+1.00

Source: 82d Airborne Division, *Airfield Seizure* (Fort Bragg, North Carolina: 82d Airborne Division, July 1998), 29.

Risk Estimate Distances

Planning factors for FEOs are considered in order to determine its feasibility of success. Just as there are planning factors for airborne operations, fire support has planning factors to consider to determine how to achieve the commanders intent. One planning factor the commander and staff can analyze to determine the right fire support platform is by comparison of each weapon systems REDS. The intent of REDS is to enable the commander to make informed decisions on the risk from friendly fire support when his troops are assaulting an objective (Polorski and Minton 1997, 8). One

consideration in the range of considerations vis-à-vis FEOs is close supporting fires. This thesis discusses fire support for FEOs, and by the nature of a FEO, units will use close supporting fires to seize their objectives. In any operation the commander has to plan close supporting fires and consider the risks involved. There are many examples throughout history of what is called “Danger Close,” bringing in fire support close to friendly troops in the hope that it will assist in stopping any enemy force. The term danger close is used when there are friendly troops or positions within a prescribed distance of the target, specifically 600 meters for cannon artillery or 1,000 meters from aircraft ordnance. It is a warning and not a restriction to both the maneuver commander and fire direction centers to take appropriate precautions. REDS take into account the bursting radius of specific ammunitions of a particular type of weapon system at a given range in relation to the probability of incapacitation (PI). PI is defined as the probability that a soldier will suffer an incapacitating injury. A 0.1 percent can be interpreted as less than or equal to one chance in one thousand (FM 3-09.4 2004, appendix A). Table 3 is an example of the tables that are provided by the Field Artillery School to help fire support planning when conducting offensive or defensive operations. The fire support officer has to advise the maneuver commander on the risks involved with close supporting fires, as it ultimately is the maneuver commander’s decision on how close he will allow fires to fall in proximity to his forces. By looking at the planning factors, the closer friendly troops are to the bursting radius of mortars and artillery the PI goes up. For example, at one-third of the maximum range for the M119 Howitzer, there is a row, follow it from left to right to the cell for one third the maximum Howitzer range at 10 percent PI, and 0.1 percent PI. Then compare 85 to 175 meters found in the columns under the two PI

sections for one third the range. This shows Howitzer fires can be 90 meters closer, but increasing the risk of up to 10 percent friendly casualties. These tables give the maneuver commander a planning range of how close he can bring in fires, or switch to a smaller indirect weapon system.

Table 3. Risk Estimate Distances (Meters)

Item/ System	Description	10% PI			0.1% PI		
		1/3 Rng	2/3 Rng	Max Rng	1/3 Rng	2/3 Rng	Max Rng
M224	60-mm mortar	60	65	65	100	150	175
M29/M29A	81-mm mortar	75	80	80	165	185	230
M120	120-mm mortar	100	100	100	150	300	400
M102/M119	105-mm howitzer	85	85	90	175	200	275
M109/M198	155-mm howitzer	100	100	125	200	280	450
M109/M198	155-mm DPICM	150	180	200	280	300	475
MK-82 LD	500 lb. Bomb			250			425
MK-83 HD	1,000 lb. bomb			300			475
MK-84HD/LD	2,000 lb. bomb			325			500
*AC-130	105-mm cannon 40/25/20 mm			80 35			200 125

*AC-130 estimates are based on worse case scenarios. The 105-mm round described is the M-1 HE round with M-731 proximity fuze. Other fuzing would result in smaller distances. These figures are accurate throughout the firing orbit. The use of no-fire headings has no benefits for reducing risk-estimate distances and should not be used in contingency situations.

Source: Department of the Army FM 3-09.30, *TTPs for Observed Fire and Fire Support at Battalion Task Force and Below* (Washington, DC: Department of the Army, January 2004), 2-31.

Contemporary Operational Environment

In order to conduct a FEO it is crucial to understand why it is necessary today. With the operational environment influencing how the armed forces fight, it is then necessary to show how the operational environment effect decision-makers plans for combat operations. Therefore, a description of understanding of how the operational environment has changed into the COE and what it affected is necessary. The past fifteen

years the COE has influenced the changes in the national military strategy. The COE is more diverse, dangerous and less predictable than the previous operational environment. This section helps explain how the COE developed and why the US had to change the way it fights as the COE emerged. Additionally, this section shows the ever-increasing need for FEO capabilities due to the COE and the force structure to support it. The US must maintain flexible and diverse units in order to meet the challenges of the COE. Since 1960 airborne operations have occurred only a few times and all of these were during a low intensity conflicts such as Grenada and Panama. Before the end of the Cold War airborne forces were trained primarily for low-intensity conflicts, while the rest of the army trained for a defensive European war. Throughout the years and changes in national strategy, units, such as the 82d Airborne Division and the Rangers, have not changed their primary mission. They are used primarily at the strategic and tactical level to be a flexible deterrent option for the US. The US airborne forces possess a strategic mobility, a "no-notice response" to be employed anywhere and at anytime to conduct combat operations with the added diversity of support and stability operations.

Since the end of the Cold War, the COE developed has been as a result of the world becoming multipolar. During the Cold War the world was divided into a bipolar order of East versus West. From a multitude of different countries with many concerns (religious, economic or political), threats are varied and many. Today, world leaders are now concerned with regional stability and global relationships. No single country or rogue nation is expected to pose a true one-on-one threat to the US. However, this does not mean that the US will not face serious challenges in the foreseeable future. World regions are more fluid and unpredictable. A current example is the expansion of the

NATO alliance. Several states that broke away from the old USSR, such as Georgia and Romania, are now seeking inclusion into NATO. NATO now has nineteen members plus relations with Russia. It has taken over ten years to really understand and define the COE. The US national and military strategy have developed and focused on understanding how to control or manage the varied threats from terror organizations, rogue states, and different religious idealists.

> The gravest danger to freedom lies at the crossroads of radicalism and technology. When the spread of chemical and biological and nuclear weapons, along with ballistic missile technology--when that occurs, even weak states and small groups could attain a catastrophic power to strike great nations. Our enemies have declared this very intention, and have been caught seeking these terrible weapons. They want capability to blackmail us, or to harm us, or to harm our friends--and will oppose them with all our power. (The White House 2002, 13)

President Bush alluded to these more diffuse but nevertheless equally serious threats and the need to oppose them at all costs in a speech at West Point in June 2002. This is reflected in *The National Security Strategy* (June 2002), which was adjusted from the previous administration once the events of 11 September 2001 unfolded. The US does not have the need for a policy of deterrence. In its place is a policy of pre-emptive attacks against the threats of the world while maintaining close relationships with states that want stability and peace. Adversaries are looking for ways to keep us out or involved in the conflict. Therefore the military can expect them to adapt their methods of fighting, using new TTPs the military is not used to. An example is Operation Iraqi Freedom (OIF). The insurgents are using multiple roadside bombs and suicide bombers to destabilize, demoralize, and inflict numerous causalities. This is what the COE is all about, an adversary adapting new ways to defeat the US military by avoiding or countering strengths and exploiting the military's weaknesses. Adversaries using maneuver of

smaller dispersed formations will counter military observation capabilities. Large-scale maneuver formations will be used less frequently. They will use sanctuary and the protection afforded by urban and complex environments reducing standoff range. Among the enhanced capabilities that are required to meet these challenges is the need to limit collateral damage and noncombatant casualties. The result is, quite simply, that the COE is more dangerous and less predictable than during the Cold War.

That said, the majority of the army is now training with the new COE, but this only started after 11 September 2001. Most of the Army divisions are heavy. These armored and mechanized divisions trained using an opposing force (OPFOR) following USSR doctrine and order of battle. BCTs culminated yearlong training schedules at combat training centers. Most brigades completed these exercises at the National Training Center in Fort Erwin California and Combined Maneuver Training Center in Germany. These training scenarios reflect the AirLand Battle doctrine of linear contiguous battlefields. AirLand Battle doctrine describes the Army's approach to generating combat power. Success is based on initiative, agility, depth, and synchronization by dividing the battlefield into three inseparable operational aspects: close operations, deep operations, and rear operations (FM 100-5 1986, 14). Heavy artillery units supported AirLand Battle doctrine by training with the BCTs. All fire support TTPs focused on this scenario. One example of this is from the leading fire support TTP manual FM 6-20, *Fire Support and AirLand Doctrine*.

> Soviet or Soviet-styled force continues to represent the greatest potential threat to the United States from now into the next century. Soviet technological achievements over the past decade have made possible great qualitative improvements in their weaponry in addition to their already significant quantitative edge It is likely that US and allied forces will continue to be

> outnumbered by a wide margin. To defeat Soviet forces, US forces must retain the initiative and prevent Soviet, or Soviet-style, forces from achieving mass, momentum, and continuous land combat. A balanced application of both firepower and maneuver is essential for US forces to achieve these goals. This calls for a synchronization of all fire support to attack critical high-payoff targets across the width and depth of the battlefield. (FM 6-20 1986, 7)

This doctrine or TTP, based on Cold War tactics in preparation for the Soviet Army's attacks across Europe was utilized at these training centers until 2001. Fire supporters trained in the same battlefield framework until the events of 11 September 2001. Table 4 describes tactics fire supporters trained with during linear-contiguous battles, that is, prior to 11 September 2001.

Table 4. Phases of Fire

Offensive Phases of Fire:
1. Fire support of movement of troops: One hour before Opposing Forces (OPFOR).
2. Fire preparation for the attack: Extensive smoke operations to conceal movement.
3. Fire support of the attack: Prep fires, rolling barrages to suppress defensive positions.
4. Fire accompaniment: Deep fires on rear echelon units to exploit success.
Defensive Phases of Fire:
1. Interdiction fire: Chemical or Scatterable minefield fires used to disrupt or delay friendly forces.
2. Fire to repel the enemy attack: Fires used to disrupt friendly formations as they enter the enemy engagement area.
3. Fire support of defending troops: Close-supporting fires as the friendly forces breech enemy defensive positions.
4. Destruction of the friendly forces during a counterattack: Close fire to support the enemy combined arms reserve forces.

Source: Department of the Army *FM 100-2-1, The Soviet Army: Operations and Tactics* (Washington, DC: Department of the Army, 16 July 1984), 8-1.

An important point here is the Army has trained with the new COE in mind for two years. These two years of training and experience continues to develop the new OPFOR and units adapting to the COE. Over the last fifteen years, the COE emerged due

to the changing world situation. In November 2003 the Chief of Staff of the Army (CSA) at Command and General Staff College stated:

> The COE has yielded new TTPs that must be rapidly integrated, resourced and trained. We must modify the CTC program to bring it in line with real-world operations. We must provide more realistic experience to units training there and provide our units with a more complex battlefield based on the contemporary operational environment instead of one modeled after the Cold War. Army unit training at the CTCs will get a rigorous fight, including offensive, defensive, stability, and support operations against an unpredictable opposing force. (Schoomaker 2003)

More recently, Fort Irwin and German-based CTCs are focusing their efforts to carry out the CSA's guidance and train armored and mechanized units with the new COE scenario to prepare them for the varied missions that will be encountered in the War on Terror. The newly published FM 7-100 series manuals, guide and train forces on the COE. Training centers are reorganizing their OPFOR to replicate the COE to better prepare rotational units for today's combat.

Light divisions train their BCTs at a different CTC--The Joint Readiness Training Center (JRTC). This CTC is based on a low-intensity conflict scenario. The JRTC has been incorporating COE with the light army and joint units for the last two years. The current and future the operational environment will cover the full-spectrum of operations. Due to the increasing numbers of breakaway states for established countries, terror-sponsored states, and regional instability low-intensity conflicts and insurgency fights will most likely be more common. The OPFOR uses TTPs and the COE variables similar to the ones described in the ST 7-100. Which in turn helps the light divisions develop the TTPs to adapt to the COE. The TTPs used in the JRTC support fighting an OPFOR that is similar to the one described in the ST 7-100. The JRTC operational environment is set up

for scenarios that have a noncontiguous and nonlinear or contiguous linear battlefield. Units like the 82d Airborne Division and Rangers get to train large FEOs against an OPFOR. Rotational units have adapted to the new tactics of low-intensity conflict and insurgency and applied these lessons learned to combat operations, such as Colonel Frank Wiercinski's experience in Operation Enduring Freedom.

> We did JRTC about a year before we came over here to Afghanistan. And while I was going through JRTC I thought to myself, Yeah - Right, we are really going to do this in a war. Media on the battlefield, fighting the enemy as a one and two man element, the integration of USAF and Special Forces, and the whole nine yards...Then we get over here to Afghanistan and what happens. I find myself and the task force fighting the Taliban in one and two man enemy teams, just like the OPFOR. We also have to integrate not just USAF and Special Forces, but a host of others including U.S. Marines, Navy, Rangers, Germans, Dutch, Canadians, British, and a media force that is right there in our face as we do things. JRTC and the CTCs definitely helped us prepare for this mission, to the point of even dealing with the civilians. (Center for Army Lessons Learned 2003 3-1)

The US has to be ready to counteract all threats, deal with support and stability operations, as well as engage in a range of other activities not normally associated with combat, such as international humanitarian relief, news media, information operations, nation building, refugees, and civilians on the battlefield. While many of the people encountered in these additional activities will not be hostile towards the US, the sheer diversity of these tasks create additional problems and causes the military to take further assets from the military and thereby reduce the overall combat effectiveness. As the military adapts to the COE, it is imperative that units conducting FEOs be ready, remain highly trained and have all the assets needed to achieve decisive victory. Since the COE has developed into a more dangerous, less predictable threat, properly resourced units with more lethality and survivability on the drop zone are crucial to achieve success. An increased need for fire support platforms is critical for FEOs. Supplying the right fire

support platform is a combat enabler to help defeat enemy. Without the correct fire support platform, it leaves maneuver units without additional firepower to provide a destructive force to overwhelm the enemy. Overwhelming the enemy with speed, mass and surprise is key in FEOs. In turn, firepower compliments and magnifies the effects of maneuver destroying the enemy.

The types of fire support platforms used for this study are the Air Force AC-130 (SPECTRE) gun-ship, tailored howitzer packages for heavy drops, the Team Fires concept of the 82d Airborne Division (two options), infantry battalion mortar systems for heavy drop, and howitzer sections air-landed as follow forces. These five systems are the most commonly trained with in accordance with doctrine and resources available. In this next section, the capabilities, limitations, firepower, versatility, and maneuverability of each of these platforms are described in order to demonstrate the importance of not excluding them in FEOs.

AC-130 (SPECTRE) Gunship

The AC-130H SPECTRE gunship's primary missions are CAS, air interdiction, and armed reconnaissance. Other missions include perimeter and point defense, escort, landing, drop and extraction zone support, forward air control, limited command and control, and combat search and rescue.

Capabilities: The AC-130 is an excellent fire support platform with outstanding capabilities. It can be used for pre-assault fires on the drop zone to set the conditions for the parachute assault during the initial phases of FEOs. The AC-130 is heavily armed with side-firing weapons integrated with sophisticated sensor, navigation and fire control systems to provide precision firepower over an area during extended periods, at night and

in adverse weather. The AC-130 gunship can suppress enemy air defense (SEAD), light armored to soft skin vehicles. It has an extremely accurate fire control system, and can place multiple-sized ordnance (105, 40, and 25 millimeter munitions) on target with first round accuracy. Fire support and surveillance missions can be coordinated as it orbits the area at a standoff distance that reduces its threat from enemy air defense. An added capability is that this aircraft is extremely proficient at destroying or suppressing targets in an urban operation environment. During Vietnam, gunships destroyed more than 10,000 trucks and were credited with many life-saving CAS missions. AC-130s suppressed enemy air defense systems and attacked ground forces during Operation Urgent Fury in Grenada. The airdrop and air-land of friendly forces enabled the successful assault of Point Salines. The gunships had a primary role during Operation Just Cause in Panama by destroying Panamanian Defense Force Headquarters and numerous command and control facilities by surgical employment of ordnance in an urban environment. Again, the use of the AC-130 gunship facilitated a successful airborne FEO for the 75th Rangers and 82d Airborne Division (Federation of American Scientists 2000a).

Limitations: The AC-130 gunship is a limited asset with only twenty-four in the military inventory. Any maintenance issues or other real world missions reduce the availability even more. Operation Just Cause had continuous AC-130 support by using a total of nine gunships rotating in and out of the airspace, It should be noted that such a level of support was slightly more that one third of the military's assets. Airspace coordination can reduce the AC-130's maximum use of firepower and versatility. If airspace coordination is not planned properly and executed flawlessly, the skies over the

FEO drop zone can be extremely hazardous. During Operation Just Cause in 1989 the skies over Panama City had over 250 special operations helicopters, AC-130s, C-130s, C-141s, and Air Force attack planes providing support for the airborne assault and air assault missions (Donelly, Roth, and Baker 1991, 86). A result from this is non-responsive close fires provided by the AC-130, because too many aircraft were in the sky. Depending on where the FEO is occurring, the AC-130 gunship has to be forward deployed for support. Generally the AC-130 has a limit of 1,500 miles, or six hours of loiter time around the objective. The AC-130 is accurate and equipped with advanced targeting gear but it cannot distinguish between friendly and enemy troops in the air. The US military has taken some risk reduction steps such as using GLINT (reflective) tape on friendly soldiers as well as soldiers on the ground using ground control lasers to properly identify targets to help in this task of differentiating friendly troops from the enemy. . However some fratricide potential still exists. During Operation Just Cause, 2d Platoon, Delta Company, 2d Light Armored Infantry received AC-130 gunfire during an attack on an objective which resulted in twenty-one of twenty-six casualties (Donelly, Roth, and Baker 1991, 151).

Firepower: Defined as the amount of fires that a unit, position, or weapon system can deliver. Fires are the effects that the commander can leverage to create favorable conditions in his area of operations. Firepower combined with maneuver can enable the commander to achieve a position of advantage. Elements of firepower include range, accuracy and target acquisition. The AC-130 gunship has 1,500-2,000 nautical mile range un-refueled, and can move to a designated loitering area to support troops in contact. The AC-130 has a sophisticated and advanced targeting system to accurately engage targets

on the ground. The AC-130 has multi-mode strike radar that provides extreme long-range target detection and identification. It is able to track 40-millimeter and 105-millimeter projectiles and return pinpoint impact locations to the crew for subsequent adjustment to the target. The fire control system offers a dual target attack capability, whereby two different sensors using two different guns can simultaneously engage two targets up to one kilometer apart. No other air-ground attack platform in the world offers this capability.

Targeting equipment installed in the gunship includes an advanced All-Light Level Television (ALLTV) system with a laser illuminator, laser target designator, laser range finder, infrared detection set, and night vision goggles for the pilots. Navigational devices include the inertial navigation system (INS) and global positioning system (GPS) both of which help to enhance its precision targeting (The Aviation Zone 2004). There are many examples of its extreme use of firepower; the following one is from Operation Just Cause.

> 4-325th AIR parachuted onto Torrijos Airport early on 20 Dec. A Co then led the battalion's combat operations by air assaulting into Ft. Cimmarron, location of the PDF's Battalion 2000. After directing fire from an AC-130 against its objective, the company hit its LZ at 1000 hrs. They met limited resistance and found 13 killed in action, 10 destroyed vehicles, and three 120-millimeter mortars. The company consolidated and awaited linkup with the remainder of the battalion on 21 Dec. (Center for Army Lessons Learned 1990, 1-9)

Versatility: Defined as the ability of forces to meet global, diverse mission requirements of the full-spectrum operations (Offensive, Defensive, Support and Stability) by quickly transitioning from one operation to another. Fire support must maintain the ability to support the full-spectrum operations in all conditions of a joint and combined environment. AC-130 gunships can operate and transition rapidly during full-

spectrum operations. Over the last ten years they have been used in all aspects of the full-spectrum operations from Panama, the Gulf War, Somolia, Kosovo, and OIF/OEF. The mission of the AC-130 is CAS for ground troops, air interdiction, armed reconnaissance, helicopter operations, fighter operations, and specialized operations. Specialized operations include combat recovery, limited command and control, point defense, and surface vehicle escort. They were used during search and rescue missions, such as the rescue of the crew of the USS *Mayaguez* of the coast of Thailand in 1975 (American Merchant Marine at War 2000). Due to the precision guidance systems on these aircraft, the crews are extremely proficient in working in military operations in urban terrain (MOUT) environments.

Maneuver: Defined as placing the enemy at a disadvantage through flexible application of combat power. Maneuver of fires is the capability to transfer and distribute the effects of fires from one point to another, being able to rapidly displace and keep up with maneuver as missions are altered. The side-firing weapons array consists of one 25-millimeter GAU-12 Gatling gun (firing 1,800 rounds per minute), one 40-millimeter L60 Bofors cannon (with a selectable firing rate of single shot or 120 rounds per minute) and one 105-millimeter M102 Howitzer cannon (firing six to ten rounds per minute). As stated before it can track and engage multiple targets at any one time. The AC-130 can maximize its ability to maneuver in air and adjust rapidly to the situation on the ground to support the maneuver commander with its mobility, rapid weapon firing systems, and ability to engage multiple targets (The Aviation Zone 2004).

Tailored Howitzer Packages for Heavy Drops

The 82d Airborne Division maintains and rotates a Division Ready Brigade (DRB) 365 days a year. The DRB is on a two hour alert up to a twelve-week cycle at a time. The DRB's sole focus prior and during the cycle is to be ready for contingency operations or war at a moment's notice and be wheels up (troops on aircraft deploying to the objective) within eighteen hours. It is the 911 force for the US. A recent example is the 18 September 1994 Operation Uphold Democracy, the 82d Airborne Division initiated the alert timeline, and by 1850 hours the Division assault troops where enroute, with the heavy drops loaded and ready for departure at 21:15 hours. However, the US averted this invasion by diplomatic means at the last minute. This diplomatic solution caused the military to shift plans and to prepare for immediate peacekeeping and nation building responsibilities. The Marines who were originally scheduled to conduct an amphibious assault, instead established security and allowed the follow-on forces of the U.S. 10th Mountain Division to conduct peacekeeping operations (82d Airborne Division 1998a 2).

Currently the 82d Airborne Division plans two types of brigade sized airborne drops. One is the DRB medium which requires ninety-six C-17s, forty-eight to drop equipment and paratroopers, then another forty-eight for air-landing the rest of the brigade to include the Initial Ready Company (IRC) from 3d Infantry Division. The IRC consists of four M1 tanks, four Bradley fighting vehicles, and two M113 armored personnel carriers. The second type of airborne drop is the DRB light, which is a battalion task force (plus), and requires about two-thirds the aircraft.

Prior to assuming the DRB mission, the brigade spends a couple of weeks preparing and packing its equipment. The DRB is one BCT, which includes the artillery battalion and other support elements. The artillery battalion packs and rigs one battery consisting of six guns and command and control equipment for heavy drop operations. One howitzer and one high-mobility multiwheeled vehicle (HMMWV) along with its basic issue items and ammunition are rigged on one thirty-two foot platform. It takes one C-130 to drop one howitzer platform and one C-17 or C-141 can drop two howitzer platforms. If the DRB gets alerted for an airborne operation, the platforms get loaded with ammunition en route to loading the aircraft. Each platform can be loaded with an estimated fifty rounds of ammunition. To heavy drop a battery with equipment, ammunition, and command and control assets will take four C-141/C-17s. What is unique is that depending on the mission and enemy, the ammunition packages can be adjusted before they are loaded on the platforms.

Capabilities: The M119A1 is a lightweight airmobile air droppable (by parachute) or towed howitzer with an average crew of seven soldiers. It provides direct and indirect fire support to highly mobile light infantry divisions. The howitzer can be quickly moved and employed to provide maximum firepower with a minimum of combat loaded weight. It also provides a low silhouette and requires no recoil pit. These combined aspects make the M119A1 howitzer one of the most lethal weapon systems in the Army inventory. The M119A1 weighs 4,000 pounds (complete with basic issue items). The prime mover is the HMMWV truck. The M119A1 is air transportable with its basic load of ammunition by the UH60 helicopter. The M119A1 fires all current 105-millimeter ammunition. Ranges for the M119A1 Howitzer are fourteen kilometers for conventional ammunition (high

explosive--HE) and nineteen kilometers for extended range ammunition with the rocket assisted projectile (Federation of American Scientists 2000b). Tables 8 and 9 at the end of this chapter show the weapon systems planning capabilities for howitzers and mortars.

Limitations: The first consideration for limitations has to be the issue of deployment to the objective. In order to conduct the airborne operation there has to be enough strategic airlift capable of delivering the BCT to the objective. By the end of 2004, the Air Force C-17 inventory will be around 134 aircraft. Thus, ninety-six aircraft dedicated to the airdrop will greatly decrease the fleet (Owens 2001, 16).

During the initial phase of any operation, heavy drop platforms can be damaged due to weather, terrain, and enemy conditions. During World War II many fire support platforms were damaged or lost resulting in the field artillery not consolidating or participating until days later. Fire support platforms are limited in reference to how much ammunition they can load. Each platform can carry up-to sixty-four rounds. If the operational tempo of the battle is prolonged or intensive, artillery ammunition can quickly run out.

Versatility: Tailored howitzer packages for FEOs allows versatility by giving maneuver commanders tailored gun platforms. Based on the guidance received from the maneuver commander on how he visualizes fighting the enemy and achieving his intent, the artillery battalion can tailor howitzer platforms to support the mission. This is done with the number of howitzers and types of ammunition needed to load on the platform to help the maneuver commander achieve success. In Operation Uphold Democracy, the 82d Airborne Division planned to drop four--not six--guns into Port Au Prince during the initial phases of the FEO to support the airfield seizure. Depending on the guidance for

fires, each platform ammunition package is tailored to how to best achieve effects by providing destructive or suppressive fires. A wide variety of ammunition can be deployed on the platforms (area, precision, and special) that can be used over a wide range of trajectory options (from direct fire to high angle) in order to support the diversity of battlefield and terrain requirements. The guidance and analysis the artillery commander receives enables platforms to be tailored. An example is designating long shooter platforms, which contain more high explosive rap rounds, or short shooter platforms if there is more of a close fight. Tailoring fire support platforms with the right amount of guns and ammunition allow the artillery to strike a wide variety of targets responsively, anytime, in any condition for the maneuver commander.

Firepower: Airborne artillery clearly provides firepower for the maneuver commander and the troops in contact. It is a flexible and responsive system for the maneuver commander, and combined with maneuver, firepower can shape and tilt the balance during combat operations. While it can take between twenty minutes and an hour for air support, howitzers can provide fires within three minutes. The close fight is timed in minutes and the unit in contact may not have time to wait for air-power to arrive on station without additional risk or causalities. This firepower capacity is demonstrated in the following quotation:

> Just before dawn, A Company made contact. As 3d Platoon approached the southern side of the eastern bridge, it engaged a platoon of Saddam Fedayeen defending from dug-in positions along the northern bank. Specialist Daniel Falcon, the 3d Platoon forward observer (FO), immediately initiated a planned target on the northern bank. Within one minute, both the battalion mortars and A Battery howitzers reported, "Shot." With one correction, the battalion mortars and A Battery rapidly delivered devastating fire onto the enemy within 200 meters of friendly troops. . . . The responsiveness and lethality of the FA and mortars enabled the paratroopers of 2-325 AIR to seize the initiative and maintain fire

> superiority throughout the two-and-one-half-hour firefight, which enemy prisoners of war (EPWs) captured days later reported inflicted 36 enemy killed in action (KIA) and more than 20 enemy wounded in action (WIA). (Luper 2003, 43)

Howitzers can range upto nineteen kilometers when using RAP or bring in close supporting fires to within couple hundred meters anytime during all weather conditions. During a few recent cases in OIF and OEF artillery rounds were brought in up to fifty meters to friendly troops. For planning purposes, howitzers can fire nearly three times the range of the 120-millimeter mortar and can be fired nearly one-third the range closer (see tables 3 and 8). During initial phases of FEOs, howitzers have to be adjusted on to the target by forward observers. Attainable accuracy for modern observer teams (FISTs, COLTs, and AFSOs), equipped with electronic and optical devices such as laser range finders and position-locating systems, has considerably improved since the days of a map and compass. Properly trained and qualified observers with these devices, enable the observer to attain first-round accuracy, whereas previously the error could be upto 500 meters of the original target. Once the howitzers achieve the five requirements for accurate predicted fire, they can be extremely accurate and not require adjusting on to the target. The five requirements for accurate predicted fire are listed in table 5:

Table 5. Five Requirements for Accurate Predicted Fire
1. Metrological Information
2. Accurate Firing Unit Location
3. Accurate Computation Procedures
4. Accurate Target Location and Size
5. Proper Weapon and Ammunition Information

Source: Department of the Army, FM 6-40, *TTPs for Field Artillery Manual Cannon Gunnery* (Wasington, DC: Department of the Army, 23 April 1996), 1-3.

Maneuver: The howitzers can transition quickly with the changing pace of the battle and provide a wide variety of effects to suppress, block, destroy, or harass the enemy. The howitzer has a maximum rate of fire of eight rounds per minute for three minutes. With this rate of fire, units can apply rounds based on the commander's intent by suppressing an objective with slow rates of fire or increasing the rate of fire to achieve more lethal effects. Crew occupation times for a nighttime airborne assault is one gun in action (assemble, de-rig the platform, and ready to fire) within twenty-five minutes in order to support the assaulting force within thirty minutes of landing. Howitzers can be sling-loaded forward if necessary to support the maneuver units as they expand the lodgment, or support a raid on a critical objective that is not in range from the drop zone. Time standards of conducting raids or air assault operations is thirty minutes to rig howitzers, twenty minutes to occupy and fifteen minutes to extract (ARTEP 6-037-30-MTP 1997, appendix C). The battery can conduct split battery operations from the drop zone to support the operation by dedicating a couple of guns to one unit and the other guns to another unit if necessary. So, for example, in Afghanistan C/3-319th AFAR deployed as a whole battery, but conducted split battery operations with three tubes each, sometimes up-to 400 miles apart. Each team supported a firebase and units operating in remote areas (Sink 2003, 16).

Team Fires Concept (Option One)

Team Fires is a concept developed by the 82d Airborne Division to achieve the intent of the Task Force. Team Fires is done through the integration, and command and control of all indirect fires assets on the drop zone under one unit. Its mission is to provide indirect fire support to the Task Force no later than twenty-five minutes after

parachute assault to facilitate the airfield seizure and follow-on operations (Airfield Seizure 1998, 14). During the initial phase of FEO, it is critical for the BCT to have positive centralized control of these indirect assets in order to integrate and employ easily. The TTP developed task organizes one or more of the battalion mortars with the direct support artillery battalion with an operational control (OPCON) command relationship. Before executing the airborne assault, the mortar platoon packs its mortar tubes and ammunition with the howitzer platform. After parachuting into the drop zone the mortar platoons unpack their mortar tubes and set them up within the artillery perimeter. This allows for the mortars to be controlled by the artillery fire direction center and greatly enhances the integration of indirect fires for the task force. Once the drop zone objectives are secure and the task force starts establishing the airhead line, the mortars are returned back under parent unit control (Uberti, 2001 22).

Capabilities: In addition to the capabilities of the howitzer as stated previously, Team Fires contains 81-millimeter mortar tubes OPCON to the artillery battalion where they are co-located within the artillery battery's perimeter. 81-millimeter mortar systems offer a compromise between the light and heavy mortars. Their range and explosive power is greater than the M224 (60-millimeter mortar), yet they are still light enough to be man-packed over long distances. The M252 is slightly lighter at about ninety-three pounds in weight and can be broken down into several smaller loads for easier carrying. Rounds for these mortars weigh about fifteen pounds each. Maximum effective range is 5,700 meters, with a minimum range of eighty meters (FM 23-90 1990, 4-1).

Limitations: When packed on the fire support platforms the howitzer ammunitions numbers are reduced in order to compensate for the addition of mortars. There is no rigid

formula for how to determine the right mix of ammunition to be loaded--as long as the total weight does not exceed the 14,690 pound weight limit. Each platform can carry up-to sixty-four rounds of artillery ammunition. A mortar section's equipment is equal to 130 pounds plus fifteen pounds for each additional round of mortar ammunition. By packing one mortar section onto a fire support platform with fifty rounds (which is equal to 880 pounds), the artillery ammunition is reduced by roughly twenty-five rounds on that specific platform. During the initial phase of the insertion, if the operational tempo of the battle is prolonged or intensive, both weapon systems can quickly run out of ammunition. Ammunition management becomes critical for the artillery battalion until resupplied. Additionally mortars have only short-range capability and do not have a wide variety of ammunition types available.

Versatility: Howitzers provide a wide variety of versatility as stated above. Howitzers combined with mortars offer an even wider variety of ammunition. The variety can be deployed on the platforms (area, precision, and special) that can be used over a wide range of trajectory options (from direct fire to high angle) in order to support the diversity of battlefield and terrain requirements. With both weapon systems centralized and integrated together on the drop zone, it allows a much greater degree of versatility than previously known in options to attack targets and support ground troops. A general TTP that can be established is that if targets are within three kilometers, the artillery battalion fire direction officer can send the mission to the mortars, or if it is beyond three kilometers send it to the cannons control (Uberti 2001, 22). Additionally it allows the unit to quickly mass all systems on an objective providing more responsive fires to support ground troops.

Firepower: Team Fires permit a very quick transition from one operation to another. Fire support must maintain the ability to support the full-spectrum operations in all conditions of a joint and combined environment (accuracy, range, and target acquisition). The M252 mortar rates of fire are thirty-three rounds per minute maximum with a sustained rate of sixteen rounds per minute. Mortars are the most responsive fire support system for the maneuver commander. They are considerably lighter and can be put into action quicker than the howitzer. Their responsiveness and rapid rate of fire in all directions, during any weather conditions at anytime allow the commander to use them in all full-spectrum operations. Initial accuracy is achieved by adjusting rounds onto the target until the guns are registered. Their range is limited to 5,700 meters. Target acquisition is dependent on the capabilities of the observers.

Maneuver: As the tactical situation develops, indirect fires must be flexible and agile in order to respond rapidly to changing demands. Joint airpower assets are not routinely responsive to these types of rapidly changing demands because it can take upto several hours to get assets. In contrast, howitzer and mortars can be ready to fire within twenty-five minutes. These combined weapons systems maintain a 360-degree firing capability and respond within minutes of receiving a mission. They can emplace within a matter of minutes in accordance with ARTEP time standards (howitzer ready times are up-to twelve to seventeen minutes for six tubes, mortar times are two to three minutes for two tubes). With a wide variety of ammunition and ranges that can be used, these fire support assets will not have to be moved unless the mission dictates. If needed, both howitzer and mortars can be moved forward by HMMWV prime mover or assault by helicopter to keep up with maneuver forces. Thus, Team Fires provide very flexible and

responsive fires that are able to maneuver quickly in ways that enhance the ground commander's capability of achieving success. Put simply, Team Fires allow the commander to distribute and apply effects when and where he wants them.

Team Fires Concept (Option Two)

The Team Fires Option One concept is a tailored package with howitzer prime movers loaded on the thirty-two-foot platforms. The evaluation criteria for Option One discussed in the previous section outlines the foundation for a second option. This option is dropping thirty-two foot platforms without howitzer prime movers. Instead, these packages are loaded with additional ammunition. These options are developed through a good mission analysis to determine how to tailor Team Fires options available for the maneuver commander based on assets available, enemy threat on the ground and the four-hour timeline to start air-lands. By reducing the weight of one HMMWV from the platform over 6,100 pounds is saved, which then, can be used to load additional howitzer or mortar ammunition. This thesis submits this as a second option available under the Team Fires concept. The thesis will depart from the normal format of comparison for Team Fires Option Two to show differences between the two options. As far as limitations and capabilities of the weapon systems, there is no change for the two options. However, limitations are reduced and firepower is significantly increased with the additional amount of ammunition that is loaded in the prime-movers space. The additional 6,100 pounds allows for fifty rounds of additional howitzer or 400 rounds of 81-millimeter ammunition. The reduction in limitation is attributed to the loss of mobility for the howitzers without their prime movers. As far as versatility is concerned, this option allows for an even wider variety of ammunition for the maneuver commander to

achieve desired effects. With the same amount of weapons systems and increased tailored ammunition packages, Team Fires Option Two can provide the right mix of field artillery and fire support for the full-spectrum of diverse operations. The evaluation criteria of maneuver increase with additional ammunition to rapidly mass more fires from one point or area to another. However, moving from place to place is reduced with less howitzer prime movers.

Infantry Battalion Mortar Systems (81-Millimeter)

The 26 March 2003 airborne drop of 173d Brigade Combat Team and air-landing of medium and heavy response companies from Europe to reinforce the northern area of operation in Iraq gave the combatant commander more options and posed an additional threat for the Iraqi regime. This airdrop of fifteen C-17s allowed a rapid buildup of over 1,000 forces and opened up the northern Iraqi front. During mission planning of OIF the brigade opted not to take artillery during the initial phase, but decided to drop mortar platforms for immediate organic fire support. These platforms consisted of the prime mover, ammunition, command and control and the 81-millimeter mortars. Here I depart from the normal format of comparisons in order to avoid repetition of capabilities and limitations as there is no change to the limitations and capabilities stated above with Team fires. Additional analysis for the 81-millimeter mortar is summed up herewith.

As for versatility, the platforms allow for an increased amount of ammunition to be dropped in the initial phases, and less aircraft to drop battalion mortars. As opposed to four platforms with a howitzer and prime mover, all battalion mortars are heavy dropped with ammunition and prime mover on one platform. In addition mortars have smaller range, and less variety of ammunition. For firepower, the amount of firepower with only

mortars is obviously less than the addition of howitzers, due to the size of the ammunition. Mortars offer more maneuverability as an extremely responsive weapon system. Less weight and size of the systems allow for an increased amount of ammunition to be dropped in the initial phases, and less aircraft to drop battalion mortars. In addition mortars can rapidly displace and emplace to support the maneuver commander if he needs to change or adapt to the situation.

Howitzer Sections Air-Landed as Follow-on Forces

Howitzer sections air-landed as follow-on forces were used quite extensively as the primary means to get into the fight during World War II albeit they arrived by glider. Today, a howitzer if not initially dropped into battle, can air-land as part of the follow-on forces once the airfield is secure. Howitzers air-landed in northern Iraq during OIF as part of a show of force after a successful airborne operation by the 173d Airborne Brigade. Again this thesis departs from the previous format due to repetition of capabilities and limitations, for howitzer sections that air-land after a parachute operation. The only additional analysis for this method is that it takes the additional organic firepower, versatility, and maneuver out of the initial phase of the airborne assault. These criteria are nonexistent or reduced until the fire support platform arrives by air-land.

Comparison

This paragraph discusses some of comparisons and contrasts between the fire support platforms evaluated. It is important to distinguish between them to identify validity of fire support platforms in FEOs. To help the reader understand which system is better, it is important to show it pictorially. Table 6 shows the best fire support system.

Table 6. Fire Support Platform Decision Matrix

	Weight	4.74	2.94	1.75	1.00	1.00	Total
	Criteria	Firepower	Maneuver	Versatility	Limitation	Capability	
FS Platform							
AC-130		2.5	3	1.5	4	1.5	28.773
Tailored Howitzer		2.5	1	2	3	2	23.269
Team Fires Option 1		2	1.5	1.5	2.5	1.5	20.498
Mortars		3	4	2.5	1.5	3	34.825
Air-Landed Howitzer		4	5	3	1	4	43.872
Team Fires Option 2		1	2	1	2	1	**15.358**

The decision matrix above is done with a program used at CGSC at Fort Leavenworth. The decision matrix uses evaluation criteria to assess the effectiveness and efficiency of each fire support platform. The evaluation criteria and fire support platforms were determined in the previous chapters. The value of the decision matrix is providing a method to compare courses of action against criteria to produce the best solution. This is only a tool, but is used frequently when Army staffs are solving tactical problems. A weight of each criterion is given based on its relative importance to each other. Values reflect the relative advantages or disadvantages of each criterion for each fire support platform. The assigned score in each column is multiplied by the weight. When using weighted value, the lower value assigned indicates the best option. The numbers are totaled to provide a subjective evaluation of the best fire support platform. In this case, firepower is weighted more than maneuver; maneuver more than versatility; versatility more than limitations and capabilities. Each fire support system is then ranked in each criterion with lower numbers being better. For example, rankings under the criteria

firepower shows, Team Fires number one, with air-landing howitzers last with number three.

The criteria in the decision matrix are in order of importance and weighted accordingly. The elements of combat power are the building blocks to achieve that end result of decisive operations. Firepower is an element of combat power, therefore is weighted the most. It is one element of combat power when combined with the other elements achieves overwhelming effects. As it pertains to fire support, firepower is the amount of fires, lethal or non-lethal that provides the right effects for the commander in combination with the other elements of combat power to defeat the enemy. The second most important criterion is maneuver. As a general guidance to conducting full-spectrum operations, FM 3-0, *Operations,* provides the principles of war, which is the foundation of Army operations. Maneuver of fires implies mobility, and the quick ability to transfer effects from one point to another. The third most important criterion is versatility. The tenets of army operations build on the principles of war for successful operations. Versatility is the ability to meet diverse requirements of full-spectrum operations. Within fire support, versatility provides the ability support all missions with the different effects anytime in any terrain for the ground commander. Lastly, limitations and capabilities were ranked last in importance due to the non-changing dimensions they bring.

In the decision matrix, Team Fires Option Two is shown to be the best solution for FEOs. Team Fires Option Two ranks best in firepower, versatility, and capabilities. Team Fires Option Two provides the advantages and flexibility to the ground commander in order to win. Team Fires Option Two provides more variety of ammunition to bring the right effects of fires to the ground commander then AC-130, Team Fires Option One

or mortars alone. Lethal and nonlethal ammunition tailored packages can provide the right mix of firepower and versatility for the commander that AC-130s or airpower cannot. Delivery of lethal high explosive from seventy meters to nineteen kilometers, while bringing these fires in as close as 165 meters to friendly troops, provides the right amount of firepower and versatility to the ground commander. The capability Team Fires Option Two brings is a variety of ranges and quicker responsiveness to provide close supporting fires for ground forces. It quickly employs and deploys through a variety of methods (air assault, airborne, prime mover). The responsiveness of Team Fires Option Two for the ground commander is a matter of minutes. Battles are won or lost in minutes not hours. Mortars and artillery provide this responsiveness through the direct support for the commander, while airpower is subject to weather conditions, weapons packaging, larger minimum safe distances, and airspace restrictions. This results in reaction time and in turn responsiveness. Through Team Fires Option Two, the ground commander in contact has the flexibility and options to achieve victory at all times in any terrain and weather conditions with this responsiveness. Tradeoffs between the two Team Fires options have to be considered based on the mission, threat, and operational timeline to airland follow-on forces. An example follows. Does the maneuver commander want to give up a couple of howitzer prime movers for additional ammunition? In FEOs, if the objective is to seize the airfield within four hours and allow for follow-on forces against a low-intensity threat (company minus), mobility of Team Fires may not be as necessary. Howitzer prime movers can be brought in to the FEO within four to six hours, allowing them to be just as mobile as Team Fires Option One to conduct follow-on operations. In this thesis firepower on the ground is the most important evaluation criteria, adding upto

fifty howitzer or 400 mortar rounds per platform has a huge impact on providing close responsive fires.

While the AC-130 Gunship brings a host of advantages to FEOs, it has some limitations that put it at a disadvantage in comparison to both options of Team Fires. Its firepower is limited by close proximity to troops (200 meters compared to 165). The AC-130 is not as responsive as the Team Fires direct support fires. Restrictions such as airspace coordination, weather, and command and control channels can reduce reaction time for the ground commander. The limited amounts and types of ammunition the AC-130 carries do not provide the ground commander the versatility of different options or effects on the ground.

Russian Airborne

The two largest Airborne Units in the world are the US Airborne Forces and the Russian Vozdushno-Desantnye Vojska (VDV) airborne assault forces. The Israeli airborne forces were not considered for the simple fact the Israeli's use them in more of a commando style with no artillery support (The Israel Defense Force 2004). As for the British armed forces, they train with artillery in airborne operations, but a lack of sufficient strategic airlift and a primarily heavier emphasis on air assault FEOs. For these reasons, neither the British nor the Israeli airborne forces permit a good comparison to the US.

The US airborne forces provide the forcible entry component of strategic force projection. The ability to project up to a brigade sized organization anywhere in the world in hours of notification looms large as a national resource to support US interests. Over the last seventy years the Russians used airborne troops in a variety of roles. The

Russians realized early the importance of using airborne forces in deep battle as a strategic weapon, and today still believe in the need for paratroopers in modern and future armies. The year 1990 was a pivotal year for the Russian forces. The Cold War had just ended and Russia was pulling out of Afghanistan. In addition, there was a general mood of nationalistic ideals for Republic States within the Soviet Union. Vast majorities of the Russian Armed Forces were located outside Russia–this included four of the six Airborne Divisions. The Soviets established the Confederation of Independent States (CIS). The CIS concept allowed each individual state to maintain a tactical army and air force, but strategic units would fall under the joint control of CIS to include the airborne divisions (Zaloga 1995, 292). The independent republics did not like this idea and instead absorbed most of the Russian forces into their own newly established state armies. As for the VDV airborne troops, they were to return to Russia and were to be rebuilt. As of 2003, the Russian Army had four airborne divisions, and three independent airborne brigades (The Military Balance 2003-2004, 89).

The VDV airborne troops are a centrally controlled force of specialized troops that can rapidly move against any threat in Russia's vast geographical spaces or on its distant borders. Currently, the VDV airborne assault forces mission is internal security and power projection in Russia. But, the VDV has also acquired a new mission: that of a peacekeeping force. VDV troops remain specialists in rapid deployment, but are now focused on low-intensity conflict and peacekeeping rather than its previous mission as the spearhead of the Soviet theater offensive. They are considered an elite force due to their individual selection from volunteers. Each division is assigned about 6,000 lightly armed

troops with lightly armored vehicles. Their value is operational and strategic mobility provided by long-range aircraft in a matter of hours (www4.janes.com dated FEB 2004)

Reorganization of their forces is still ongoing, but the core of the Russian Army is to establish a mobile force with two main elements: the Immediate Reaction Force and the Rapid Deployment Force. The Immediate Reaction Force is composed of mostly the VDV. In contrast, the Rapid Deployment Forces are the heavy portion, based on tanks, motorized rifle, and heavy artillery (Zaloga 1995, 310).

The VDV Airborne Divisions consist of three airborne regiments containing BMDs and one artillery regiment along with support assets. Depending on the Airborne Division, artillery in the Airborne Regiment can vary from eight to eighteen 2S9 self-propelled howitzers. The Airborne Artillery Regiment can vary from twelve to thirty-two 2S9s with some BM-21s or D-30s (Jane's Information Group 2004).

Although the Russians have not conducted any airborne operations since World War II, they still maintain this capability as a necessary strategic mobility means that cannot be provided by other divisions. In the Cold War years, the Soviet airborne was the largest in the world with seven divisions and used as shock troops to invade Western Europe. The big difference between the Russian VDV and the 82d Airborne Division is that the VDV make heavy use of light armored vehicles and artillery. The airborne regiments primarily consist of 120-millimeter 2S9 Nona-S (Anemone). The 2S9 is a self-propelled howitzer-mortar and is an airborne artillery assault vehicle that has been developed to carry out two tactical functions: conventional artillery equipment to replace existing mortars and howitzers and as a direct fire antitank weapon system firing high explosive antitank (HEAT) projectiles. The 2S9 has a crew of four: commander, driver-

mechanic, gunner and loader and is an amphibious vehicle. The 120-millimeter mortar has a rate of fire of six to eight rounds per minute. In the indirect fire role the 2S9 fires a limited variety of ammunition: high explosive, white phosphorous, and smoke rounds. The 2S9 takes thirty seconds to come into action and a similar time to come out of action. It can be paradropped or air-landed. The 2S9 has a maximum range of over twelve kilometers and basic load of ammunition of forty to sixty rounds. The 2S9 have been in the inventory since 1985 and are replacing the D-30 towed 122-millimeter howitzers that the airborne divisions had previously used. Two airborne division's assets with the wide range of equipment are shown in tables 6 and 7.

Table 7. 76th Guards Airborne Division (Pskoy)

HQ's 76th	Sub-Unit	Locaton	Strength
	104th Guards Airborne Regiment	Pskov	31 BMD-3s, 4 BTR-Ds, 34 ACVs, 12 2S9s
	234th Guards Airborne Regiment	Pskov	8 BMD-2s, 18 BMD-3s, 4 BTR-Ds, 32 ACVs, 12 2S9s
	237th Guards Airborne regiment	Pskov	3 BTR-Ds, 29 ACVs, 8 2S9s
	1140th Artillery Regiment	Pskov	18 2S9s, 6 D-30s

Source: Jane's Information Group 2004.

Table 8. 106th Guards Airborne Division (Tula)

HQ's 106th	Sub-Unit	Locaton	Strength
	119th Guards Airborne Regiment	Narofominsk	70 BMD-2s, 31 BMD-3s, 23 BTR-Ds, 37 ACVs, 18 2S9s
	51st Guards Airborne Regiment	Tula	101 BMD-1s, 32 BTR-Ds, 33 ACVs, 18 2S9s
	137th Guards Airborne Regiment	Ryazan	100 BMD-1s, 25 BTR-Ds, 32 ACVs, 18 2S9s
	1182nd Artillery Regiment	Yefremov	17 2S9s, 6 D-30s

Source: Jane's Information Group 2004.

The Russian VDV is about two-thirds the size of the 82d Airborne Division. Each VDV Airborne Division has more artillery than the 82d Airborne Division and until recently had BM21 122-millimeter rocket launchers. A further distinguishing factor of the VDV is that they have a significant number of armored vehicles to provide more maneuver, force protection, versatility, and firepower. However, the problem that faces the VDV is the strategic airlift capability to project these forces and time to train. This is due to the low readiness of military transport aircraft combined with the present collapse of the Russian economy and the potential disintegration of the Russian aerospace industry. These factors reduce any attempts by the Air Force to reorganize, restructure, or build a viable and militarily significant force in the short-term. Recently, the VDV conducted regimental airborne exercises to include over 1,000 paratroopers and more than ten pieces of combat equipment. If needed, the VDV can tailor their airborne drops based on the enemy threat. The potential for a highly maneuverable and lethal force projection is there.

In this chapter some analysis and comparisons are presented to determine the right fire support platform for FEOs. It showed a brief explanation on what is involved with the conduct of FEOs in relation to the COE's emergence in the past fifteen years. It briefly highlights that past doctrine have not kept up with the COE and CTCs are now just training with the variables of COE to develop today's Army units. The criteria are then compared to the types of fire support platforms used in FEOs verbally and pictorially. Finally, a comparison of an American airborne unit to the Russians airborne forces shows the differences in organization, plus some of the criteria evaluated

previously. In the following chapter, all the evidence will be analyzed together for the best fire support platform recommendation, and further research will be recommended.

Table 9. Field Artillery Cannon Assets

Weapon	Ammunition		Range (Meters)			Rate of Fire/Notes
	Projectile	Fuzes	Maximum	DPICM	RAP	
105-MM M102	HE, HC, WP ILLUM APICM	PD, VT, MT, MTSQ, CP, Delay	11,400	10,500	15,300	Sustained rate of fire: 3 rounds per minute, Maximum rate of fire: 10 rounds per minute.
105-MM M119A1	HE, HC, WP ILLUM APICM	PD, VT, MT, MTSQ, CP, Delay	11,500	14,100	19,500	Sustained rate of fire: 3 rounds per minute, Maximum rate of fire: 10 rounds per minute.
155-MM M198	HE, HC, WP ILLUM, CPHD APICM, DPICM M825 SMK SCATMINE	PD, VT, MT,MTSQ, Delay	18,300 or 22,000 with M795 HE, M825 SMK	18,000 or 28,200 with M864	30,100	Sustained rate of fire: 2 rounds per minute, Maximum rate of fire: 4 rounds per minute.
155-MM M109A5/ A6	HE, HC, WP ILLUM, CPHD APICM, DPICM M825 SMK SCATMINE	PD, VT, MT, MTSQ, Delay	18,200 or 21,700 with M795 HE, M825 SMK	17,900 or 28,100 with M864	30,000	Sustained rate of fire: 1 rounds per minute, Maximum rate of fire: 4 rounds per minute.

LEGEND:
APICM – anti-personnel improved conventional munition
CP – concrete piercing
CPHD – Copperhead
DPICM – dual-purpose improved convention munition
HC- hexachloroethane
HE – high explosive
ILLUM – illumination
WP – white phosphorous
MT – mechanical time
MTSQ – mechanical time superquick
PD – point detonating
RAP - rocket assisted projectile
SADARM – sense and destroy armor
SMK - smoke
VT – variable time

Source: Department of the Army, FM 3-09.4, *TTPs for Fire Support at Brigade Operations* (Washington, DC: Department of the Army, January 2004), A-3.

Table 10. Mortar Assets

Weapon	Ammunition		Range (Meters)		Rates of Fire/Notes
	Model	Type	Minimum Range	Maximum Range	
60-MM M224	M720/M889 M722 M721 M302A1 M83A3 M49A4	HE WP ILLUM WP ILLUM HE	70 70 200 35 725 45	3,500(1) 3,500 3,500 1,830 950 1.830	30 rounds per minute for 4 minutes (2), then 20 rounds per minute sustained. Diameter of Illumination: M721 – 500m: M83A3- 300m.
81-MM M29A1	M374A2 M374A3 M375A2 M301A3	HE HE WP ILLUM	70 73 73 100	4,600 4,790 4,595 3,950	25 rounds per minute for 2 minutes, then 8 rounds per minute sustained. Diameter of Illumination: 360m.
81-MM M252	M821/M889 M374A3 M819 M375A2 M853A1 M301A3	HE HE RP WP ILLUM ILLUM	80 73 300 73 300 100	5,800 4,790 4,800 4,595 5,060 3,950	30 rounds per minute for 2 minutes, then 15 rounds per minute sustained. Diameter of Illumination: 650m.
120-MM M120	M57 M68 M91 M933 M934 M929 M930	HE WP ILLUM HE (PD) HE (MDF) WP ILLUM	200 200 200 200 200 200 200	7,200 7,200 7,100 7,200 7,200 7,200 7,200	15 rounds per minute for 1 minute, then 4 rounds per minute sustained. Diameter of Illumination: 1,500m.
HE – High Explosive WP – White Phosphorus ILLUM – Illumination RP – Red Phosphorus			(1) Bipod-mounted, charge 4 (Maximum hand held is 1,300 meters). (2) Charge 2 and over, 30 rounds per minute can be sustained		

Source: Department of the Army, FM 3-09.4, *TTPs for Fire Support at Brigade Operations* (Washingtion, DC: Department of the Army, January 2004), A-3.

CHAPTER 5

CONCLUSIONS AND FURTHER RESEARCH

Conclusions

This chapter ties together the analysis from chapter 4 in order to answer the research questions addressed in this thesis. Additionally chapter 5 discusses further recommendations regarding fire support in FEOs. This thesis examined and compared different fire support platforms used in FEOs with the intent of determining the right fire support system to support maneuver during FEOs. Specifically, the thesis researched the questions of determining whether: tube artillery is still needed in initial phases of airborne FEOs; it is a combat enabler in the COE; changes from past doctrine are now invalid; and other countries have similar or different capabilities when conducting FEOs.

Using a historical methodology, this thesis analyzed written records of past occurrences and drew some conclusions from the research collected. By examining the capabilities and limitations of the different types of fire support platforms in FEOs, differences between fire support systems could be systematically and rigorously established. A comparison of the firepower, versatility, and maneuver of each fire support platform delineated distinctions of important criteria, from US Army base doctrine, such as FM 3-0, *Operations*.

This thesis determined that FEOs in today's COE are extremely important. FM 3-0, *Operations*, clearly states that one mission essential task for the Army is: "Conduct Forcible Entry Operations" (2001, 1-4). A rapidly deployable lethal force capable of conducting FEOs has a huge impact in all levels of war (strategic, operational, and tactical). The goal is to project this force with overwhelming maneuver and firepower

when needed to protect the interests of the nation. Additionally, through the US being able to maintain the capability of using such a force, the commander has the option of deterring or compelling an adversary to behave in a favorable or peaceful way. Operation Uphold Democracy is a recent example of this. With two brigades of paratroopers from the 82d Airborne Division enroute to Haiti, Haitian officials agreed to a peaceful transition of government, which resulted in a permissive entry of American forces. If this airborne operation had been executed, over 3,900 paratroopers with more than one hundred heavy drop platforms to include fifteen Sheridan tanks and four howitzers would have seized drop zones and conducted combat operations (Kretchik, Baumann, and Fishel 1998, 51).

The COE is characterized by adaptive adversaries--the importance of which for this thesis is that adaptive adversaries present unique challenges for indirect fires and maneuver forces. Adaptive adversaries present a more dangerous and testing environment for the military forces. These adversaries use maneuver of several smaller dispersed formations to obtain one objective. They reduce the effectiveness of our observation platforms by using sanctuaries and the protection afforded by urban and complex terrain. In addition to the enhanced capabilities needed to meet the challenges of the COE are the related needs to limit collateral damage and noncombatant casualties. For rapid deployable forces, such as the 82d Airborne Division and the Rangers, these challenges are not as different from the days of AirLand Battle doctrine. Today, however, the mechanized forces are more challenged and have the cumbersome burden of adapting to meet these trials. These challenges necessitate the determination of what fire support platform to use in the initial phases of FEOs.

This thesis demonstrates that tube artillery is needed in the initial phases of FEOs. It provides the commander on the ground additional firepower to accomplish the mission. As shown when comparing the criteria, capabilities and limitations of various fire support platforms (see in chapter 4), this is an asset that cannot be left behind or come in later with follow-on forces. It provides that commander additional firepower that compliments maneuver as a destructive force in overcoming the enemies will to fight. This is not to say that a BCT should heavy drop eighteen howitzers. Rather, a small tailored package to initially secure the objectives and expand the lodgment with upto six howitzers can provide integrated, synchronized, and immediate close fires for the commander. The mobility, variety of ammunition, accuracy and versatility of the 105-millimeter howitzer, makes the howitzer a key combat multiplier for FEOs.

The TTPs for this capability can always be improved with new equipment and methods of employment of the sensor to shooter. The accuracy over the last six years has increased by the use of new equipment to help survey (gun laying positioning systems and global positioning systems) and computational software (hand-held terminal units) for tube artillery on the drop zone. Other new developments in the near future, such as portable MET stations and light-weight countermortar radar (LCMR) for mortar acquisition will doubtless help enhance the accuracy and responsiveness. With this equipment, indirect fires can be brought in closer to friendly troops as they suppress or destroy objectives or enemy formations with less ammunition. TTPs for sensor (observer) to shooter (weapon system) are improved through detailed planning and rehearsals prior to execution. Recently, trends at JRTC showed that close fires are not responsive due to sensor to shooter architecture and clearance of fires procedures (Weustner 2002, 5). By

weighting the main effort, using decentralized operations, pre-clearing fires at the lowest execution level, sensors reduce the time to apply this additional firepower with the maneuver forces. These systems not only benefit tube artillery but under the team fires concept enhance the accuracy and responsiveness of mortar fires.

Artillery is a combat enabler in the COE. Simply, artillery brings increased firepower on the drop zone because in affords a variety of ammunition delivering a variety of effects, all weather capabilities, the ability to employ fires close to friendly forces, and the ability to support all types of missions. In today's COE, FEOs--especially those with immediate contact with the enemy--are very dynamic and challenging with rapidly changing conditions. Airborne artillery and mortars in support provide the versatility, responsive firepower, and maneuver to support the ground forces. Joint airpower supplies another means to support ground forces, but by the nature of habitual command and control relationships and longer responsiveness to rapidly changing demands, airborne artillery and mortars provide that up close personnel asset to meet the ground maneuver commander's intent anytime.

Airborne artillery doctrine is different from the past AirLand Battle doctrine. While airborne operations have not changed much since World War II, the equipment has changed. Examples are larger faster aircraft, automated navigational equipment for accurate drops, better infantry weapon systems, and indirect fire weapons systems. These improvements of the last sixty years developed a smaller more lethal force that is projected to a crisis quicker through mass envelopment, and which surprises the enemy faster than before. AirLand Battle doctrine describes the Army's approach to generating combat power at the operational and tactical levels (FM 100-5 1986, 14). The big

difference is the operational environment. AirLand Battle doctrine is based on a linear battlefield divided into areas (deep, close and rear). Today's COE does not have a neat and orderly battlefield organization. FM 3-0, *Operations*, the Army's baseline doctrine now focuses on the COE: by adding versatility to its basic tenets, and information to the elements of combat power. The military forces now will achieve strategic responsiveness to conduct simultaneous deployment, shaping and decisive operations (FM 3-0 2001, 3-1). This change in our base doctrine has not caught up with the field artillery manuals, FM 6-20-40/50 *Fire Support TTPs for Brigade*, FM 6-50 *TTPs for the Field Artillery Cannon Battery* are still current even though published in the early nineties. However, the field artillery school is in the process of changing all key TTP manuals, and currently most are in draft. These drafts address COE and are formatted to reflect full-spectrum operations addressed in FM 3-0, but do not address how to use airborne artillery or discuss planning tools to help decide which platform is needed. Field artillery doctrine only addresses airborne operations with a checklist of things to consider in an airborne operation. Airborne artillery units address their own unit specific TTPs through standard operating procedures (SOPs) such as the 82d DIVARTY *Redbook* and *Fire Support Handbook*. These documents get reviewed and updated once completing major operations (training or real) and apply lessons learned to new SOPs to capture better ways of conducting operations. This process enhances artillery units to be a combat multiplier in future operations.

Other countries have airborne forces and use them more in a commando role rather than a conventional force such as the 82d Airborne Division. For example the Israeli Paratroopers Brigade have a history of carrying out special forces-style missions

dating back to the 1950s. They are currently involved primarily in counter terror operations within the West Bank. Their goals are to have an elite infantry force, with innovative and improved fighting skills within other infantry units. They have no organic artillery, just mortars. The Paratroopers Brigade had only one operational combat parachute drop. It was during 1956 Sinai War, where one battalion of infantrymen seized Parker's Memorial in Egypt as a diversionary tactic and later linked up with the rest of the Brigade (Brown 1986, p 6). The Russians and British forces use paratroopers in the conventional method. Both have organic artillery in the airborne brigades. The Russians use an Air Mech Strike (AMS) concept in their airborne forces. For artillery they use both self-propelled and towed artillery. The British tend to use their artillery in a helo-assault role. The Russians field more airborne units than the US, and with the self-propelled howitzer (120 millimeter 2S9 Nona-S), they offer a force protection and mobility factor that towed artillery does not have. This weapon used as a howitzer and antitank gun can provide more firepower, versatility and maneuverability than the 105-millimeter howitzer in the 82d Airborne Division. Since 1953 the Russians developed light tracked vehicles and armor to build ground mobility into its airborne units (Grange et al. 2002, 82). In fact, the Russian airborne forces use a combination of light mechanized vehicles with paratroopers that provide mass, surprise and increased firepower to achieve decisive success. Today, the Russian airborne forces remain highly trained and the most efficient ground combat force at Moscow's command. In the future, they are most likely to be used in Chechnya like conflicts in the Russian periphery and international peacekeeping operations (Jane's Information Group 2004).

Recommendations

This thesis focused on FEOs within the coup de main task of seizing airfields, in order to allow for follow-on operations. This requires speed, surprise, and seizing critical objectives and relieved early once follow-on forces are established in theater. It is determined that the primary means of fire support in FEOs is close supporting fires. Therefore, the recommendation for this thesis is the employment of Team Fires Option Two as the right fire support platform for FEOs. AC-130 Gunships, prior to and after the airborne drop, combined with Team Fires Option Two on the drop zone provides the ground maneuver commander the firepower, versatility, and maneuver to execute a decisive operation during FEOs. However, the primary reason for Team Fires Option Two, is to provide close supporting fires during decisive operations in order to fix, or suppress enemy forces to enable freedom of maneuver. Maneuver complemented with firepower provided by Team Fires Option Two provides that destructive force to compel the enemy's will to fight.

Team Fires Option Two provides the ability to rapidly deliver and tailor effects to support the maneuver commander through responsive massing of fires while selecting the right ammunition. Team Fires Option Two can rapidly overcome changes in environment, rules of engagement, and weather. Building bigger ammunition packages instead of loading howitzer prime movers mitigates the risk of mobility. With a four-hour timeline to secure the airfield and limited threat during FEOs, more mobility can be sacrificed for additional firepower. While the AC-130 is a lethal and valuable asset, it does not provide the direct support responsiveness of Team Fires Option Two. The AC-130's mobility can be restricted airspace coordination or weather. Its type of ammunition

limits its versatility to support the rapidly changing environment of the ground commander. Further issues for the AC-130 is command and control to request fires, a limited inventory, and target identification on the ground.

Team Fires Option Two contributions are many. It is fully integrated and synchronized with maneuver, delivers the variety of effects, employs close to friendly troops, an all weather and twenty-four weapon system, and supports all the variety of operations demanded of the maneuver commander. Currently airborne infantry pays for their mobility by sacrificing firepower; recently the 82d Airborne Division deactivated its only Air Mech capability of airborne tanks (Sheridan). In the future airborne artillery will play an important role by making up for the reduction of firepower with its field artillery airborne assets.

Further Research

For further consideration the 82d Airborne Division has a continued need for lethality and survivability when conducting FEOs. Currently the airborne artillery can provide immediate and effective fires to help destroy the threats they face in the initial phases of FEOs. But, any improvement to enhance this capability would significantly increase their firepower. To improve this capability, this thesis recommends looking at organizations from the Russian airborne forces, and models from the book of *Air-Mech-Strike*.

The US military is on the right track for strategic lift. With over 500 C-130s and a projected inventory of 188 C-17s, they will meet any need for strategic brigade drops, air-lands and resupply in the following phases of the FEOs. However a further consideration is the increased firepower, survivability and mobility of the US forced entry units. 82d

Airborne Division came close by using Sheridan tanks in Operation Just Cause. An option to consider is the AMS concept written by David L. Grange et al. This book shows that as the military transforms to adapt to the COE, the US Army must provide an expanded need to project robust forces to strike adversaries. The book states:

> The U.S. Army must furnish the nation a land force without equal, that is strategically responsive across the full-spectrum operations, that provides the national command authority and joint combatant commanders a genuine short-notice deterrent and intervention capability; that can, if deterrence fails, prosecute a war at a tempo and overmatching intensity that achieves victory on terms advantageous to the US. (2002 16)

This book offers an alternative idea of air mechanization designed to drop by air, helicopters, or air-land, and achieve decisive action through positional advantage. It uses lightweight mechanized forces with dismounts. They can rapidly deploy, defeat a light force and if necessary transition to mechanized warfare. This type of force offers enhanced mobility, survivability, and firepower with the versatility of operating in all combat operations.

Other options for increased firepower to enhance artillery and mortars are the use of precision-guided munitions. Currently both artillery and mortars are looking at precision-guided munitions to increase the effects and variety of options for targets. Mortars with precision-guided munitions will make an even greater contribution to the close fight at company and battalion levels during FEOs.

LIST OF REFERENCES

82d Airborne Division. 1998a. Training Circular, *Airfield Seizure*. Fort Bragg, North Carolina: 82d Airborne Division, G-3, July.

_____. 1998b. Training Circular, *Organization and Capabilities Guide*. Fort Bragg, North Carolina: 82d Airborne Division, G-3 Plans, 27 February.

Airfield Seizure. 1998a. *See* 82d Airborne Division 1998a.

Aitken, David M. 2003. The Fallacy of Single Source Fire Support. Thesis, Monterey, California: Naval Postgraduate School.

American Merchant Marine at War. 2000. *Capture and Release of SS "Mayaguez" by Khmer Rouge Forces in May 1975*, 5 June. Web page. Available from: www.usmm.org/mayaguez.html. Internet. Accessed on 5 February 2004.

ARTEP 6-037-30-MTP. 1997. *See* Department of the Army. 1997

The Aviation Zone. 2004. *AC-130 Gunship Fact Sheet.* Web page fact sheet. Available from: www.theaviationzone.com/factsheets/aC-130.asp. Internet. Accessed on 5 February 2004.

Blair, Clay. 1985. *Ridgway's Paratroopers: The American Airborne in World War II.* New York: The Dial Press.

Bonham, Gordon C. 1991. Airfield Seizure: The Modern Key to the Country. Monograph, Fort Leavenworth, Kansas: Command and General Staff College.

Brehm, Norman. 1995. Evolving Field Artillery Standard Tactical Missions for Force XXI. Thesis, Fort Leavenworth, Kansas: Command and General Staff College.

Brown, Ashley. 1986. *Strike From the Sky: Israeli Airborne Troops*. New York: Villard Books.

Center for Army Lessons Learned. 1990. CALL Bulletin 90-9, *Operation JUST CAUSE Lessons Learned*. Vol. 1:8-9. Fort Leavenworth, Kansas: Center For Army Lessons Learned, October.

_____.2003. COE Handbook 03-3, *How to Fight at the Combat Training Centers*. 3-1. Fort Leavenworth, Kansas: Center For Army Lessons Learned, March.

Chairman of the Joint Chiefs of Staff. 1997. *The National Military Strategy*. Washington DC: US Government Printing Office, May.

_____. 2000. *Joint Vision 2020*. Washington DC: US Government Printing Office, June.

Clancy, Tom. 1997. *Airborne.* New York: Berkley Publishing.

Department of the Army. 1984. FM 100-2-1, *The Soviet Army: Operations and Tactics*. Washington, DD: US Government Printing Office, 16 July.

_____. 1986. FM 100-5, *Operations*. Washington, DC: US Government Printing Office, 5 May.

_____. 1988. FM 6-20, *Fire Support in the AirLand Battle.* Washington, DC: US Government Printing Office, 17 May.

_____. 1990a. FM 23-90, *Tactics.* Washington, DC: US Government Printing Office, 19 September.

_____. 1990b. FM 90-26, *Airborne Operations.* Washington, DC: US Government Printing Office, 18 December.

_____. 1996. FM 6-40, *Tactics, Techniques, and Procedures for Field Artillery Manual Cannon Gunnery*. Washington, DC: US Government Printing Office, 23 April.

_____. 1997. ARTEP 6-037-30-MTP, *Mission Training Plan Field Artillery Cannon (Consolidated) Firing Battery.* Washington, DC: US Government Printing Office, 15 December.

_____. 2001a. FM 3-0, *Operations*. Washington, DC: US Government Printing Office, 14 June.

_____. 2001b. FM 3-90, *Tactics.* Washington, DC: US Government Printing Office, 04 July.

_____. 2002a. FM 3-09.4, *Tactic, Techniques, and Procedures for Fire Support Brigade Operations Revised Final Draft.* Washington, DC: US Government Printing Office, (Date Pending).

_____. 2002b. FM 3-09.30, *Tactic, Techniques, and Procedures for Fire Support at Battalion Task Force and Below Final Draft.* Washington, DC: US Government Printing Office, (Date Pending).

Devlin, Gerard M. 1979. *Paratrooper! The Saga of the U.S. Army and Marine Parachute and Glider Combat Troops During World War II.* New York: Saint Martin's Press.

Donnelly, Thomas, Margaret Roth, and Caleb Baker. 1991. *Operation Just Cause*. New York: Lexington Books.

Federation of American Scientists. 2000. *AC-130 Gunship,* 8 January. Web page. Available from: www.fas.org/man/dod -101/sys/ac/ac-130.htm. Internet. Accessed on 15 January 04.

Federation of American Scientists. 2000. *M119A1 Howitzer,* 6 February. Web page. Available from www.fas.org/man/dod-101/sys/land/m119.htm. Internet. Accessed on 5 February 2004.

Flanagan Jr., Edward, M. 2002. *Airborne: A Combat History of American Airborne Forces.* New York: Presidio Press.

FM 3-09.4. 2002a. *See* Department of the Army. 2002a.

FM 3-09.30. 2002b. *See* Department of the Army. 2002b.

FM 3-0. 2001a. *See* Department of the Army. 2001a.

FM 3-90. 2001b. *See* Department of the Army. 2001b.

FM 6-20. 1988. *See* Department of the Army. 1988.

FM 23-90. 1990a. *See* Department of the Army. 1990a.

FM 6-40. 1996. *See* Department of the Army. 1996.

FM 90-26. 1990b. *See* Department of the Army. 1990b.

FM 100-2-1. 1984. *See* Department of the Army 1984.

FM 100-5. 1986. *See* Department of the Army. 1986.

Glantz, David M. 1984. Combat Studies Institute Research Survey No. 4, *The Soviet Airborne Experience.* Fort Leavenworth, Kansas: United States Army. Command and General Staff College, November.

Glass, Scott T. 2000. Cannons Under Canopy, American Parachute Field Artillery In Operation Market-Garden. *Field Artillery Journal* 5, no. 4 (July-August):18-24.

Grange, David L., Huba Wass de Czege, Rich Liebert, Chuck Jarnot, Al Huber, and Mike Sparks. 2002. *Air-Mech-Strike, Asymmetric Maneuver Warfare for the 21st Century.* 2d ed. Kentucky: Turner Publishing.

Greer, William L., Martin J. Holland, Charles W. Kean. 2003. 101st Division Artillery: Fighting with Artillery Fires in an Urban Environment. *Field Artillery Journal* 8, no. 5 (September-October): 17-20.

The Israel Defense Force. 2004. *IDF Units*. Web page. Available from: www1.idf.il/DOVER/site/mainpage.asp. Internet. Accessed on 13 March 2004.

Jane's Information Group. 2004. *World Armies, Russian Federation*. Web page. Available from www4.janes.com. Internet. Accessed on 28 February 2004.

Joint Pub 3-03. 1997. *See* United States Joint Chief of Staff. 1997.

Joint Pub 3-09. 2001a. *See* United States Joint Chief of Staff. 2001a.

Joint Pub 3-18. 2001b. *See* United States Joint Chief of Staff. 2001b.

Joint Vision 2020, 2000. *See* Chairman of the Joint Chiefs of Staff. 2000.

Kretchik, Walter E., Robert F. Baumann, and John T. Fishel, 1998. *Invasion, Intervention, Intervasion: A Concise History of the US Army in Operation Uphold Democracy*. Fort Leavenworth, Kansas: United States Army, Command and General Staff College.

Lunsford, James R.1993. Keeping the Airborne Division a Viable Force. Thesis, Fort Leavenworth, Kansas: Command and General Staff College.

Luper, Benjamin R. 2003. 82d Airborne Artillery in the Battle of As Samawah. *Field Artillery Journal* 8, no. 5 (September-October): 43-45.

Maples, Michael D. 2002. The FA and the Objective Force: An Uncertain but Critical Future. *Field Artillery Journal* 7, no. 4 (September-October): 3-6.

Moore, Hal G., and Joseph L. Galloway. 1992. *We Were Soldiers Once and Young.* New York: Random House Publishers.

The National Military Strategy. 1997. *See* Chairman of the Joint Chiefs of Staff. 1997.

Organization and Capabilities Guide. 1998b. *See* 82d Airborne Division 1998b.

Owens, Robert C., and Todd A. Fogle. 2001. Air Mobility Command and the Objective Force: A Case for Cooperative Revolution. *Military Review* 81, no.1 (January-February): 11-19.

Pokorski, Gerard, and Minton, Lonnie A. 1997. Risk Estimate Distances for Indirect Fires in Combat. *Field Artillery Journal* 2, no. 2 (May-April): 8-10.

Schatz, Rowayne A. 1994. *Airborne Forcible Entry Operations: USAF Airlift Requirements*, Fort Leavenworth, Kansas: Command and General Staff College.

Schoomaker Peter J. 2003. *Relevant and Ready*, Fort Leavenworth, Kansas: Command and General Staff College. November.

Sink, James A. 2003. First Lethal FA Fires in Afghanistan: Lessons Learned at Firebase Shkin. *Field Artillery Journal* 8, no. 6 (November-December): 16-17.

United States Joint Chief of Staff. 1997. Joint Pub 3-03, *Doctrine for Joint for Joint Interdiction Operations*. Washington. DC: Director for Operational Plans and Interoperability, J-7, 10 April.

_____. 2001a. Joint Pub 3-09, *Doctrine for Joint for Fire Suppor*. Washington. DC: Director for Operational Plans and Interoperability, J-7, 12 May.

_____. 2001b. Joint Pub 3-18. *Doctrine for Joint for Forcible Entry Operations.* Washington. DC: Director for Operational Plans and Interoperability, J-7 16 July.

Uberti, John, and John J. Herrman. 2001. Team Fires: Taking Responsibility for Task Force Morters. *Field Artillery Journal* 6, no. 2 (March-April): 22-24.

United States Army. Command and General Staff College. 2003. ST 7-100, *Battle Book for the Contemporary Operational Environment.* Fort Leavenworth Kansas: USA CGSC, June.

The White House. 2002. *The National Security Strategy of the United States of America.* Washington, DC: The White House, 17 September.

Wuestner, Scott G. 2002. Faster Fires: TTP for Sensor to Shooter and Clearance of Fires Operations. *Field Artillery Journal* 7, no. 1 (January-February): 5-7.

Young, Thomas S. 1996. Force XXI Field Artillery: King of Battle or Twenty-First Century Dinosaur? Thesis, Fort Leavenworth, Kansas: Command and General Staff College.

Zaloga, Steven J. 1995. *Inside the Blue Berets: A Combat History of Soviet and Russian Airborne Forces, 1930-1995*. California: Presidio Press.

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